THE IRON AGE

A Review of the Hardware, Iron, [illegible] Metal Trades.

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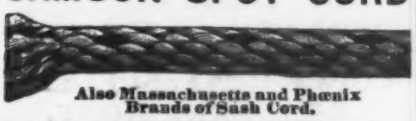

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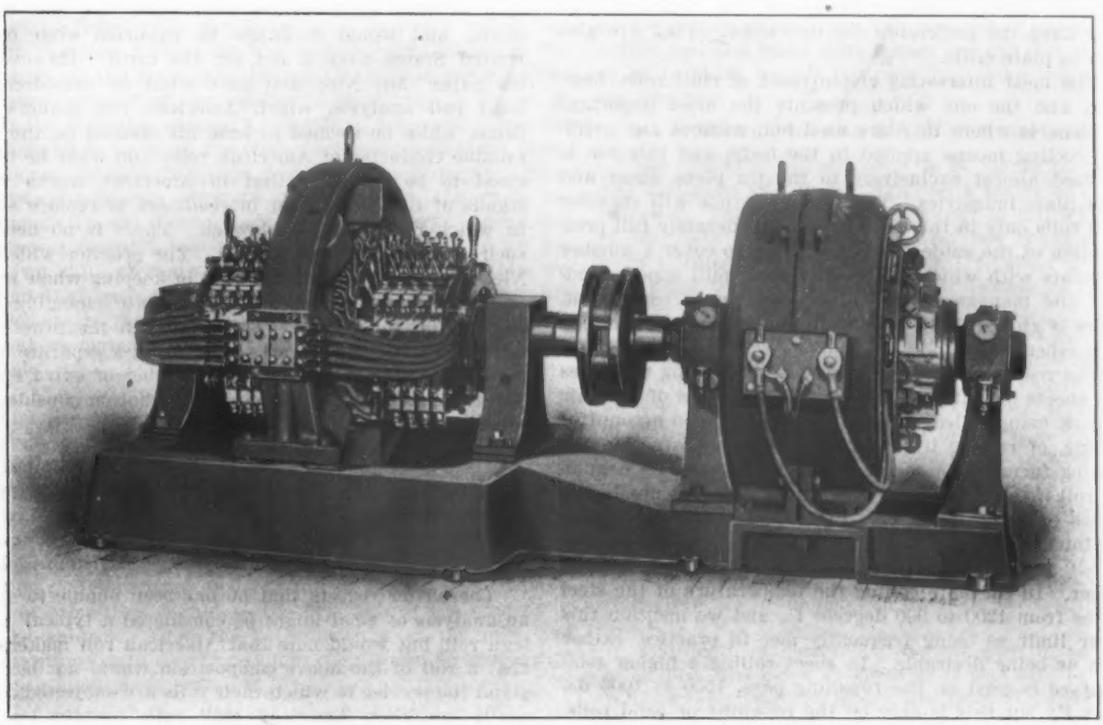
THE IRON AGE

THURSDAY, APRIL 23, 1903.

The Zucker & Levett & Loeb Plating Dynamo.

While the art of commercial electroplating has not advanced greatly in the past decade, so far as quality of product is concerned, there has been a great increase in the amount of work done, and the consequent greater importance of economical production has brought about a vast improvement in the capacity and reliability of materials and apparatus.

As an indication of the advance which has taken place we here illustrate an electroplating generator completed recently by the Zucker & Levett & Loeb Company, of 526-530 West Twenty-fifth street, New York. This machine possesses several new characteristics in design and construction, and is of very unusual capacity. Being separately excited from the motor supply circuit it is capable of a wide range of regulation with fine adjustment. It is of 3000 amperes capacity at six volts full load, and the adjustments are such that any voltage below this can be obtained. To one accustomed to high voltage machines the relative sizes of the commutators to the balance of the machine will be noticeable.



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The armature wires are soldered directly to the commutator, thus insuring a perfect electrical contact, which cannot be obtained with screws. Steel instead of cast iron is used in the magnet circuit, with the result that a more powerful field is obtained and better regulation secured. The armature is of the toothed form, the result being a field free from distortion and the commutation being sparkless. The coils are all wound to form and are exactly alike, so that it is possible to remove and replace a coil, in case of accident, without entirely rewinding the armature. This construction also insures perfect ventilation, since almost every inch of the wire is directly exposed to the air.

The Spence Mfg. Company, 279-283 Park street, Milwaukee, Wis., have taken up the manufacture of babbitt metal, with the assistance of Richard Raddatz, an expert in this line for many years with the Edw. P. Allis Company of Milwaukee.

The Wanamaker Building at Philadelphia.—The Wanamaker department store at Philadelphia, which is to cost approximately $5,000,000, is to be erected on the site of the Wanamaker store at Thirteenth and Chestnut streets, and will be 12 stories in hight with a basement and sub-basement, having a frontage of 250 feet on Market and Chestnut streets and 479 feet on Thirteenth and Juniper streets. The building will be of brick, stone and steel construction with terra cotta trimmings. The roof will be covered with asphalt, the floor beams, girders and columns being of steel. It is stated that the floors will be of marble mosaic tiling and white maple laid on concrete bases. It is designed that the foundations, laid in concrete, will extend 47 feet below the street level, while the building will be 200 feet above this level. The architects, D. H. Burnham & Co. of Chicago, have not authorized any figures, but the data herewith given is regarded as approximately correct. The plans are said to call for a first floor 22 feet high, a second story 16 feet and the other floors 12 feet high. The light court, which will be in the center of the building, will cover an area 72 x 152 feet. It is estimated that about 18,000 tons of structural steel will be used. The building will have a floor space of 1,676,500 square feet, equal to about 38½ acres, and will be equipped with 62 passenger and freight elevators. The power house will occupy a separate building on Juniper street, below Thirteenth, being connected with the main building by a tunnel through which all pipes will be carried. All boilers and engines, of course, will be located in the power house. All plans are expected to be completed within three weeks. It is estimated that the Wanamaker department store, to be erected at New York, will require 15,000 tons of structural steel.

Chill Rolls.—I.

The Problems of Their Manufacture and Use.

BY B. E. V. LUTY.

The manufacture of chill rolls constitutes a very important branch of the rolling mill foundry trade. There are about a dozen foundries in the United States making chill rolls for a variety of uses, the principal being in the manufacture of sheets and tin plates, these industries consuming about 5000 rolls annually, costing considerably over $1,000,000. Outside the sheet and tin plate industries there has of late years been a greatly increased employment of chill rolls in rolling various sections, particularly rails. These uses arise from entirely different motives; chill rolls are used in rolling sheets and tin plates because their hard smooth surface imparts a smooth surface to the product, while they are used in rolling sections not on this account, but because they wear so much less than sand rolls that the correct section of the pass does not have to be restored nearly so often by returning. Chill rolls are used to a limited extent in the cold rolling of the softer metals, but hardened steel rolls have the preference for this work. They are also used in plate mills.

The most interesting employment of chill rolls, however, and the one which presents the most important problem, is where they are used hot, without any artificial cooling means applied to the body, and this use is confined almost exclusively to the tin plate, sheet and light plate industries. The present article will consider chill rolls only in this aspect. In a moderately full presentation of the subject it is necessary to cover a number of points with which all tin and sheet mill superintendents and managers may be supposed to be conversant. There is almost daily evidence that they are not familiar with other points.

The reason chill rolls are used hot in rolling tin plates and sheets is that on account of the thinness of the pair or pack being rolled, and the impossibility, on account of scaling, of raising it to a very high temperature in the heating furnace, the metal would rapidly lose its heat to the roll if the latter were cold, and a sufficient number of passes could not be given. In ordinary tin plate rolling the thickness of the metal rolled varies from about 4-10 to 1-10 inch; in sheet rolling the upper limit is a little higher. In tin plate rolling the temperature of the steel varies from 1200 to 900 degrees F., and we mention this lower limit as being frequently met in practice rather than as being desirable. In sheet rolling a higher temperature is used on the roughing pass, 1500 to 1600 degrees F., but this is only on the roughing or sand rolls, and is done to scale the bar. In tin plate rolling there must be no scale. A temperature of 1200 degrees corresponds to a medium cherry red, while 900 degrees is just about the limit of visibility. The chill rolls in sheet and tin plate work are generally between 650 and 800 degrees in the central portion, shading off to a lower neck temperature.

It is this using of the chill rolls hot which introduces practically all the vexed problems in connection with their use and is the foundation for the never ending discussion between the roll maker and the roll user in regard to the failure of rolls. It is not nearly as generally realized as it should be that the whole problem of chill rolls is one governed by certain simple laws of nature, the difficulty being not so much in the understanding of the laws themselves as in determining their application, for the reason that rolls are expensive and tests to destruction are regarded as too costly, while it is impossible to see into the roll either during its manufacture or when it is in use, in order to determine what is going on. A proper understanding of the subject has also been retarded by the faulty reasoning of workmen in the ranks unacquainted with the general laws of physics. The writer can say without fear of successful contradiction that in this business there has been a great deal more theorizing on the part of men unacquainted with general natural laws than there has been by those who understand these laws, such incorrect theories having done much to retard progress and the proper investigation of the subject.

The importance of having the very best rolls for rolling tin plate and sheets is shown by the fact that the average pair of rolls stands for a product of about 400 tons, and as a new roll is worth about $20 more than an old one, this is equivalent to a roll cost of $1 per ton of output, a big item in these days when the cost of making tin plate is figured down for each plant to the last cent per ton. Nor is this all. When a roll breaks, instead of wearing out, there is product lost while a new roll is being put in place and time lost in getting the new roll warmed up, after which it is considered necessary to handle it carefully for a week or two. Anything which would double the average life of a roll or cut the breakage in half would mean a saving of between 60 and 75 cents per ton of output, or over 1 per cent. on the total value of the product.

British and American Rolls.

This comparatively high expense in a minor item of rolling mill cost does not indicate that American rolls are not good. They are probably of better quality than those of any other country. E. D. Nicholson, in a paper read a few years ago before the South Staffordshire Institute claimed that Staffordshire rolls were the best in the world, and would doubtless be exported even to the United States were it not for the tariff. However, in his paper Mr. Nicholson gave what he considered an ideal roll analysis, which American roll makers condemn, while he seemed to base his opinion on the "unreliable character of American rolls" on what he understood to be the fact, that in American works whole stands of rolls were kept in readiness to replace stands in which rolls might be broken. There is no need for such practice, nor does it exist. The practice which Mr. Nicholson had heard of was that of keeping whole stands of grooved rolls made up, to facilitate changing from one section to another. This has been the practice at Lorain ever since the works were built, a separate building being provided for the large number of extra stands. The analysis of a roll which Mr. Nicholson considers an ideal one follows:

Ideal Staffordshire Chill Roll.

Silicon	0.650
Sulphur	0.050
Phosphorus	0.250
Manganese	1.500
Graphitic carbon	2.865
Combined carbon	0.635

The writer regrets that he has been unable to obtain an analysis of what might be considered a typical American roll, but would note that American roll makers say that a roll of the above composition would not begin to stand the service to which their rolls are subjected. Generally speaking, American chill rolls contain less impurities, and have a much deeper chill than the British. American roll makers have the choice of all kinds of pig iron to select from, and can arrive at any mixture they may desire. Mr. Nicholson gives an average of 5000 tons of cold blast pig from Staffordshire and Shropshire, analyzed at intervals over a period of three years, which is regarded not only as very fairly representative of the average iron turned out by the furnaces, but also as being the analysis which the roll makers desire, and is as follows:

Silicon	1.110
Sulphur	0.109
Phosphorus	0.475
Manganese	0.646
Graphitic carbon	2.443
Combined carbon	0.538

With such iron as the above British roll makers make chill rolls quite different in analysis from the "ideal" roll cited, but which are claimed to be just as good, the ideal analysis not being obtainable because the iron would cost too much. In the United States there is no difficulty in obtaining iron much purer than is necessary. The maker has, for example, the white charcoal irons made in the Lake Superior region, which run as follows:

Silicon	trace to 0.10
Sulphur	trace to 0.018
Phosphorus	0.12 to 0.22
Manganese	0.10 to 1.00
Graphitic carbon	1.10 to 1.65
Combined carbon	1.75 to 1.00

The above iron is graded as No. 6 and is given merely as representing the greatest purity. The actual mix for chill rolls contains more sulphur and phosphorus with much less combined carbon, resulting from the proper combination of the metalloids. The American roll maker has all the variety of iron he can possibly desire to make any ideal mix.

The impression has prevailed outside the roll foundry that nothing but new warm and cold blast charcoal pig, with sparing additions of old rolls, was employed in the mix, but this impression is yielding to the facts in the case. Even coke pig is used. Not many years ago a coke iron which chilled was regarded as a freak, but it is no longer so, and such chilling pig made in coke furnaces is now a regular market commodity, being used in the manufacture of car wheels and to a limited extent in chill rolls.

In some roll foundries there is practically no employment of chemical analysis. In others it is the absolute rule. In one case at the outset analyses were obtained of a large number of rolls which had stood good service, irrespective of who made them, and the start was then made from an ideal analysis, modifications being made as practice indicated.

The Real Problem of the Roll Maker.

The writer would not essay any attempt to point out how rolls should be made. The first question is to determine what rolls should be after they are made. In the complex actions of the various metalloids can be found all the influences desired to regulate the physical characteristics of the casting to what may be found to be the desirable standard. Sulphur, apparently used in England to increase the chill, increases shrinkage; phosphorus reduces shrinkage, but decreases strength; manganese increases strength and decreases the chill, although an old dictum runs to the contrary; silicon decreases strength, shrinkage and chill. Thus, if we set down chill, strength and low shrinkage as desirable, we find that each metalloid favorably affects one desirable element at the expense of one of the others. Some roll makers claim, however, that a large shrinkage is desirable.

The real problem of the roll founder is, therefore, to find the proper mix to avoid the greater proportion of evils, and on this problem an immense amount of time and thought has been spent. But the difficulty has been that the ideal sought was merely a casting whose physical traits were largely unknown, and when sent out into the world would be treated according to the caprice of the mill manager or roller. To eliminate this personal equation and substitute an ideal roll of certain defined physical properties should be the first aim of the student of the subject. Then the determination of the mix and questions as to the operation of casting can be approached with much more certainty.

Making the Roll.

Starting with the mix which the individual foundry regards as most desirable, and consisting of warm and cold blast charcoal pig, old roll and other scrap, and possibly some coke pig, the iron is melted in an "air furnace," which means really an open hearth furnace, the flame playing across the bath. Cupola iron has been used, but is very objectionable. The air furnace can be used so that besides melting and mixing the charge certain chemical reactions can be brought about. The mold is built up of several sections of chill for the body, the necks and wobblers being ordinarily molded in sand, although chills have actually been employed for the necks also, and would, of course, be desirable did they not weaken the roll. All rolls are bottom cast, with an arrangement at the bottom of the mold by which the iron enters the cavity with a swirl, the object being to evenly distribute fresh metal against the chill mold and promote evenness in the chilled portion of the roll. A sinking head is provided at the top, in which impurities may collect. As the metal strikes the chill mold it instantly solidifies to a certain depth, the central portions remaining fluid for some time, an annealing effect being produced by the gradual cooling after the chill has set.

The condition of the roll as to general shape and chill varies greatly in different foundries, and even in the same foundry. Some rolls have a clear line between the chill and the gray portion, while others shade from chill to gray very gradually. Sometimes the chill is thicker on one side than on the other, and in other cases shrinkage produces an elliptic section, the area of an ellipse being less than of a circle of equal circumference. The chill may be thicker at one end than the other. Rolls are frequently condemned by the maker before they are turned, while the turning often shows up defects.

The Contest Between Maker and User.

It is the honest desire of every reputable roll maker not to send out a chill roll which has any defect which may interfere with its usefulness. There is nevertheless a running contest between maker and user as to whether rolls which have failed in service have been poor rolls or have been misused. This is not surprising in view of the fact that neither party can hope to completely understand his own business, and knows still less of the other's. What is surprising, however, is that so little effort has been made to study the problem on a scientific basis, so as to arrive at common ground for comparison.

One element in the situation has done very much toward improving the general quality of rolls, and that is that there has been very little competition as to price. Mill owners are willing to pay a fair price, and this price is so well settled that competition has been mainly on the matter of quality. The roll maker knows he can reduce cost and make more money per roll, but if he does so he is likely to lose business and make less profit in the long run.

Dimensions and Life of Chill Rolls.

The standard tin plate roll is 26 inches in diameter and 32 inches long in the body, with necks 20 inches in diameter. Longer rolls are used only to roll wide packs of tin plate. The leading interest has changed all its mills to rolls 26 inches in diameter. In sheet mills there is a much wider range of sizes, on account of the much greater variety of gauges and widths rolled.

In Wales tin plate rolls 16 to 18 inches in diameter were the standard a dozen years ago, and the upper limit even now is not often exceeded. The early tin mills built in the United States in 1890 to 1892 had rolls 20 to 22 inches in diameter, but 24 inches soon became the standard. As late as 1898, however, there were several mills equipped with these small rolls, but 24 inches had become the standard, with a few 26-inch rolls in use. The desire to increase the diameter was so great that in cases where the windows in the housings would not permit the larger roll the housings were chipped out, and rolls 26 inches in diameter in the body used, with 19-inch necks.

The depth of clear chill in rolls used to be from ½ to ⅝ inch, this being as much as it was safe to put in a roll, as the chance of longer life from there being more chill to be worn and turned off was balanced by the increased danger of breakage. By greater skill in the manufacture of rolls and more care in the handling, but mainly on the former account, rolls are now used with much deeper chill, ⅞ inch being about the average. In England most mills are still content with from ½ to ⅝ inch available chill.

No two roll makers hold the same view as to what life a chill roll should be expected to have, but the general average lies between 90 and 120 actual working days for tin plate or ordinary sheet rolling. While the breaking of rolls was regarded in the past as an unmitigated evil, and one to be avoided at all hazards, it is now admitted by some of the most practical mill managers that the advantages of greater output may well warrant running the risk of breaking a good roll occasionally.

The question of the durability of a roll is not one which requires discussion at this time. Durability can unquestionably be increased at the expense of increasing the danger of breaking before the chill has all been used up, and the problem is therefore to determine why rolls break and then find out how to avoid the breaking. After that the way is open, by well understood methods of deepening and hardening the chill, to make rolls which it will take longer to wear out.

Why Chill Rolls Break.

The question of why chill rolls break in service is one still unsettled after years of discussion involving many fanciful and absurd theories and neglecting many simple and important natural truths. Broadly speaking, one side of the argument is that the broken roll was not a good one, and the other side is that it was misused. One party will claim that it is practically impossible to break a good roll, while the other will claim that the roll shows its own evidence that it was a good one, from the appearance of the broken surfaces.

Both parties have some right on their side, and both know well enough that the other is not entirely wrong. The roll maker knows himself that there are casting strains in all his rolls, but does not spend the money necessary to determine by actual experiments how great they are, or how they can be reduced. The mill man knows that pressures put on rolls are sometimes too great, and that they are subject to too great variations in temperature, but does not investigate just how much of such strains a roll ought to be able to stand.

It is entirely possible, in the light of present knowledge, to reduce the question of breakage to three heads: 1, Casting strains and variations in the coefficient of heat expansion in different parts of the roll; 2, pressure on the roll from the metal being rolled; 3, heat strains produced in the roll by irregular working. The problem is to determine the proportionate influence of each. In some cases of breakage all three may have exercised an influence worth considering.

The Pressure on a Chill Roll.

The load, applied at center, which would be required to break a roll in which no factors, such as internal strains, operated to reduce the strength is calculated by the following formula:

$$W = \frac{4f}{l} 0.0982\, d^3$$

where W is the load in pounds applied at center, f is the fiber strength, l the distance between supports, and d the diameter.

The fiber strength may safely be taken at 20,000 pounds per square inch. Any fairly good chill roll iron should exceed this. G. R. Henderson even claimed* that car wheel iron test bars should stand a fiber strain of 48,000 to 56,000 pounds. The length, in a standard tin plate roll, with 32-inch body, housings 14 inches thick, and 1 inch between housing and barrel, is 48 inches, the diameter being 26 inches. The reduction in diameter at the neck occurs so far from the center that it is negligible.

On such a standard roll the load applied at the center necessary to break it would be 2,887,000 pounds. In ordinary rolling of tin plates and sheets nothing like this pressure is or should be exerted. No actual tests have been made, but from a variety of considerations it is pretty safe to assert that the ordinary pressure is less than a tenth of this. But there are cases where from carelessness or ignorance the draft is made entirely too great, or where the steel is cold, and then the pressure is greatly increased. From a combination of these it is absolutely known that pressures approximating this limit of strength have been reached, without breaking the roll. Cases were found where the housing screws actually bound from swelling to such an extent that the practice was introduced of tapering the bearing end, so that any deformation of the screw should occur at this point, where the inconvenience is minimized. The minimum diameter of the screw portion was 6 inches, giving a total area of the two screws of 56.55 inches, and dividing this into 2,877,000 pounds would give 51,100 pounds per square inch. It may well be admitted that the resistance to compression of such steel as these screws are made of should not be less than this, and if the general reasoning is correct, and one of the most prominent tin mill engineers claims it is, then a roll which would so deform the screws was strained to a point where breakage was avoided only by its fiber strength being greater than 20,000 pounds per square inch.

Such cases are entirely abnormal and should never occur. The fact is cited mainly to show the error of any one who claims that a broken roll is evidence of nothing else than a fault in the roll or in its heat treatment. Nor is that all. It is well known that the continued repetition of strains far below the elastic limit of steel or iron will ultimately cause rupture. The metal in a chill roll is subjected to regular alternations of tension and compression. As the average speed at which tin mills are run is 30 revolutions per minute, it follows that a chill roll which lasts 90 days has had its metal subjected to 3,888,000 alternations of compression and tension, corresponding to breakage at a fiber stress far below the elastic limit. There is evidence here of the fallacy of the reasoning which assumes that if a roll stands its first fortnight's service it has proved itself a good roll, and one which will not subsequently break except through abuse.

(To be continued.)

* "The Manufacture of Car Wheels," Transactions A. S. M. E., May, 1899, Vol. 20.

British Naval and Marine Notes.

LONDON, April 9, 1903.—The spring meeting of the Institution of Naval Architects was held last week, and a number of important matters of abiding interest to structural steel manufacturers were discussed. Those who concern themselves specially with naval architecture will, of course, obtain the full report of the proceedings in due course. A few points may, however, be brought into prominence without delay.

Cost and the Ratio of Speed.

The president in his address dealt with the vexed question of the relation of cost to high speed. Among the most important events in naval engineering last year were the steam trials of the armored cruiser "Cape of Good Hope." On her eight-hour full power trial, this vessel (of 14,100 tons displacement) attained a mean speed of 23.05 knots, the highest speed attained by any vessel in the Royal Navy other than torpedo craft. The progressive speed trials carried out with her had yielded information which would doubtless be of value to designers of vessels of this class. By the speed curves plotted from the trial results, it would appear that to go from half speed (11.5 knots) to full speed (23 knots) needed, roughly, 26,000 additional horse-power; while the last knot alone absorbed 8621 horse-power. That was to say, to progress from 22 to 23 knots needed as much power as the total required to drive the ship at about 16 knots; or, to put it in still another way, the power needed to drive the "Cape of Good Hope" at full speed would propel two similar vessels at about 19 knots. The coal consumption at full speed was, roughly, 26 tons per hour, at 19 knots about 11 tons per hour. Again, at full speed the ship would steam 0.85 knot for each ton of coal burned, while at 19 knots the distance would be doubled for a similar consumption of fuel. Such was the price paid for high speed afloat.

Modern Accessories in War Ships.

W. H. Whitin, assistant director of naval construction, read an interesting and suggestive paper on "The Effects of Modern Accessories on the Size and Cost of War Ships." The paper brilliantly illuminates the immense addition to cost and weight involved in modern accessories. Here are some instances he gave: Until 20 years ago the weight of the largest steamboats carried by most vessels was about 9 tons, and they could be hoisted at davits by hand; but now most of our large battle ships and cruisers carried two 56-foot steam pinnaces, each weighing 18 tons, which required heavy mechanical appliances for hoisting. Thus the replacement of two 9-ton boats by two 18-ton boats meant an addition, not of 18 tons, but of at least 70 tons to the weight carried, and to carry this load without loss of speed or other qualities an addition to the displacement considerably exceeding 70 tons would be necessary. Again, some particular item, instead of being increased in magnitude, might be developed with the object of increasing its efficiency or lessening the chance of a breakdown, and an example of the great weight involved in such elaboration of a set of fittings for a single purpose was afforded by the anchor and cable gear. On the whole, the opinion of the con-

ference was that this question of the weight of accessories must be faced very soon.

Wharf Crane Service in American Shipyards.

W. A. Fairburn on the third day of the proceedings submitted a paper on "Fitting out Wharf Crane Service in American Shipyards." The references made to American shipbuilding may be of some interest. In the paper the lecturer described the wharf crane service now existing in each of the American shipyards and navy yards, and discussed their advantages and disadvantages, suggesting a few points worthy of consideration in the design of such installations. He remarked that 12 years ago none of the American yards was equipped with an efficient wharf crane service. Temporary wooden shears and derricks used to be principally in vogue, but now almost every yard of note was fitted with its own independent and permanent hoisting appliances. American shipbuilding companies not only made it a practice to build propelling machinery for the hulls they constructed, but also built all classes of vessels in the same yard. Hence practically every yard must be complete and independent in its equipment, and on account of the great variety of ship construction the wharf crane service was worthy of special attention. Nevertheless, it must be admitted that this question had not, as yet, been given the consideration it deserved, and questions of cost, a variable policy and a lack of appreciation, of the conditions to be complied with, had resulted in many systems that were primitive and without much real merit, although devices possessing many advantages had undoubtedly been produced in some cases.

Corrosion in Metal Pipes on Board Ship.

The last paper of the conference was by A. W. Stewart on "Corrosion in Metal Pipes on Board Ship." The lecturer said that Professor Cohen's investigations, supplemented by those of A. F. Yarrow, went to prove that sea water co-operating with atmospheric air was corrosive in its action on metal pipes. Such corrosion was to some extent normal in its action, depending on the quality of the sea water and the nature of the metal employed, but instances occurred in which pipes corroded at quite abnormal rates. For these abnormal cases electric currents from the ships' dynamos were often blamed. Rapid deterioration of this kind had occurred in ships of the Russian volunteer fleet, and the author had investigated the matter to discover whether or not the electric currents in the ship were its cause. The paper contained a full account of his inquiries, his conclusion being that the corrosion was due neither to electricity as supplied for lighting, fans and bells, nor to the system of wiring, but principally to the quality of engine room oils in use. He suggested that no olive or other vegetable oil should in future be used for lubricating purposes, and recommended the employment for the future of mineral oil of good quality, together with thorough cleaning and washing with caustic soda of the engine room bilges and bilge and discharge pipes.

The New Turbine Cross Channel Steamers.

The two cross channel steamers which are being built by W. Denny & Brothers of Dumbarton, and engined by the Parsons Marine Steam Turbine Company, will be on service this summer. The engines for one of these boats —that for the Dover-Calais route of the Southeastern & Chatham Railway—are completed and ready for dispatch to Dumbarton. The other vessel is for the Newhaven-Dieppe route of the Brighton Railway, and her engines are well in hand. S. G. H.

The Iron and Steel Institute.—At the London meeting, to be held on May 7 and 8, Andrew Carnegie will deliver his inaugural address, and the following papers will come up: "On the Alleged Diffusion of Silicon into Iron," by J. E. Stead: "On the Influence of Sulphur and Manganese on Steel," by Prof. J. O. Arnold and G. B. Waterhouse, Sheffield; "On the Open Hearth Process," by Lieut.-Col. L. Cubillo, Trubia, Spain; "On the Application of Electric Furnaces in Metallurgy," by Albert Keller, Paris; "On Hollow Pressed Axles," by C. Mercader, Pittsburgh; "On a New Blast Furnace Top," by Axel Sahlin, Millom; "On the Manufacture of Portland Cement from Blast Furnace Slag," by C. von Schwarz, Liége; "On the Continuous Process Working on Hematite Iron," by B. Talbot, Leeds; "On the Effect of Flue Dust Upon the Thermal Efficiency of Hot Blast Stoves," by B. H. Thwaite, London; "On a Specimen of Sussex Cast Iron," by Prof. T. Turner, Birmingham. Reports on research work carried out during the past year will be submitted by O. Boudouard, Paris; by W. Campbell, New York; by A. Campion, Cooper's Hill; by P. Longmuir, Sheffield; by E. Schott, Berlin, and by F. H. Wigham, Wakefield, the Andrew Carnegie research scholars of 1902.

The Independent Labor League.

WASHINGTON, D. C., April 21, 1903.—An application has been made to the Department of Commerce and Labor on behalf of the so-called Independent Labor League of America for the formal approval by Secretary Cortelyou of the aims and objects of this organization. In view of the public functions of the Department, the Secretary has been obliged to decline to take any action in the matter either officially or personally.

The subject of official approval for the new organization of laboring men was presented to Secretary Cortelyou by Rev. E. M. Fairchild of Albany, N. Y., an honorary member of the League, which was recently organized in Elmira, N. Y., and incorporated under New York laws on March 19. Headquarters have been opened in New York City, and it is the purpose of the promoters of the movement to give it a national character, to accomplish which it is desired to secure the sanction of prominent officials, economists, philanthropists and others whose influence would be likely to aid in the extension of the movement. The present plan of the organization is described in the following brief memorandum:

"Several features distinguish it from labor unions other than the name 'League.' While it is made up solely of non-union men, it does not aim to build up a strike-breaking bureau, such as has been operated in England. It has no list of professional strike breakers. It proposes to drop the strike as a weapon of labor. Its scheme for so doing has been worked out to its finest points in the constitution drafted in Elmira. First, it has taken for its motto the quotation from Emerson, 'Of what avail the plow or sail, or land, or life, if freedom fail?' It has aimed to be American and to insure the employer that his men are pushing his business to its limit. They are to work in harmony with him as men of sense. But should the time come when their demands should not be granted by the employer, the matter shall be taken to their council. At this point the honorary members—another provision providing for one honorary member for about every one hundred men—shall be called in. These men shall have a voice, but no vote, in the meetings. They are to be men of judgment and high standing in the community. By the advice of these men it is thought that employer and employees can be brought together. In case they should not, the league provides that any man not satisfied with his condition shall go out of the work and go about his own business. A labor bureau will locate him individually as soon as possible in a better position. If the man desires he may remain in his former employer's hire until he secures another position from the bureau."

The representatives of the organization state that the movement has been fully approved by the National Metal Trades Association, and that similar organizations now in existence in Dallas, Tex., Spokane, Wash., Anderson, Ind., Muncie, Ind. and Dayton, Ohio, have been invited to become members of the Independent Labor League of America.

The representatives of the League were especially anxious to secure the formal approval of their project by Secretary Cortelyou, owing to the fact that the new Department is charged by law with the Federal supervision of all matters affecting labor. It is obvious, however, that the purposes of the league are so different from those of the leading labor organizations of the country that should the new Department accord it official approval such action would be construed at once as hostile to so-called "union" labor. Mr. Cortelyou's declination, however, was based upon the fact that the statute under which the new Department has been organized does not contemplate the recognition or approval of any form of labor movement. W. L. C.

The Louisiana Purchase Exposition at St. Louis.

THE PRESENT STATUS.

Rapid progress is now being made in the construction of the exhibit buildings on the grounds of the Louisiana Purchase Exposition at St. Louis. Since the advent of more favorable weather and the settlement of the strike of the "staff" workers building has been pushed and the result of each day's efforts now is plainly discernible even to the uninitiated. The outlook for continued rapid progress is also favorable. At this writing four of the largest and principal buildings—Education, Machinery, Electricity and Varied Industries—are nearing completion. The Liberal Arts Building, too, is but little behind the first four, being already under roof and the frame work ready for the "staff." In this latter building will be held the dedicatory exercises, which take place on April 30. Work on the Manufactures Building is well under way, and contracts have been let for the Transportation and Mines and Metallurgy buildings. The brick work on the east wing of the Fine Arts Building is ready for the ceiling joist, and the frame work on the west wing is completed and brick work begun. Notwithstanding these two wings are to be temporary structures only, unusual efforts—and a liberal expenditure of money—are being made to provide a safe housing for the art treasures. The foundations of the central Fine Arts Building, which is to be a permanent structure, were laid over a week ago and floor joists are in position. One of the boiler houses, too, is completed, and all but two of the foundations are ready for the installation of the boilers. Work has been begun upon the briquette manufacturing plant also.

From the foregoing it is evident that nine of the 15 departments—each of which is to have a building—will be practically provided for within 60 days. For the other six divisions—agriculture, horticulture, forestry, fish and game, anthropology and social economy and physical culture—no buildings have yet been constructed. But it is understood that bids are being taken and contracts have already been let for a number of State buildings, although little if any work has been begun upon State structures. It is understood also that work will have been begun on the United States and French Government buildings by the time of the dedication.

Location and Topography of Grounds.

To understand the progress thus far made it is essential to be somewhat acquainted with the location and topography of the grounds upon which the Exposition is being located. The western portion of Forest Park, belonging to the city of St. Louis, with some adjoining property belonging to the Washington University, was secured for the Exposition. These tracts of land embrace about 1180 acres located 6 miles southwest from the business heart of the city. Of this area about 668 acres were taken from Forest Park, which, at the time grading and excavation were undertaken for the Exposition buildings, was a virgin forest. It was necessary to sacrifice many of the noble trees, and, because of the fills required upon the location where now stand the principal exhibit buildings, many piles were driven to secure firm foundations. The site of the Exposition is about 2 miles long from east to west, and 1 mile wide; the land is estimated as being worth $15,000,000.

Location of Buildings.

By reference to the ground plan it will be seen that the Exposition site is divided by Skinker Road, to the east of which, in the northern portion of the grounds, is located the main group of exhibit buildings. The Machinery, Transportation, Electricity, Varied Industries, Education, Manufactures, Mines and Metallurgy and Liberal Arts buildings are located on the same level, covering an area of about 300 acres. To the east and south the land rises, advantage being taken of the natural topography to form terraces reaching back to the Fine Arts Building, which crowns the summit of the most prominent hill. The section of the grounds upon which the various State buildings are located is of a rolling character broken by low hills, and in this section the forest trees will not be disturbed except in spots where necessary to construct buildings.

Cascade and Gardens a Central Feature.

From an architectural and landscape standpoint the central feature of the design adapted is the Cascade Gardens, and the arrangement of the buildings has been planned to enhance the artistic effect of this feature. The Grand Basin, into which the waters from the three cascades pour, is excavated. At the time of the dedication the basin will be flooded with water. In constructing the water way leading from the basins to the east and west, flowing around the Electricity and Education buildings on either side, advantage was taken of the natural stream which runs through a portion of the grounds. This water way has been completed, and is now covered. The main avenue or boulevard is 600 feet wide, and leads from the Grand Basin northeast between the buildings of Varied Industries on the west and Manufactures on the east, while at right angles to it, and a continuation of the water way above referred to, is Transverse avenue, the eastern end of which will be commanded by the United States Government Building, which is to be located on rising ground, and the western end terminates at the site of the French Government Building, also to be located at a commanding hight.

The Colonnade.

The cascades and gardens are to occupy the slope of a natural amphitheater, the terraces being crowned by a colonnade; square piyons alternating with columns. This colonnade is to be 52 feet high, occupying an arc of 1500 feet or more than ¼ mile. The peristyle commands the entrances to a Festival Hall, having a dome and lantern 150 feet in hight and covering an area of 2 acres. The two arms of the peristyle terminate in circular pavilions 130 feet in diameter and 100 feet high, which will be utilized as restaurants. At the moment the ground is being prepared for the pavilions and the terraces formed. On a level with these pavilions the terrace will be occupied by buildings erected by the 14 States which have been carved from the Louisiana Purchase territory. On the plateau back and above the Terrace of States is the Fine Arts Building, to which reference has already been made.

Colonial and Foreign Buildings.

From the ground plan it will be noted that it was the original intention to place all the Colonial and Foreign buildings on the western half of the grounds—that is, west of Skinker Road. The German Government, however, has chosen a plateau on the east between the Fine Arts and the United States Government sites. The Japanese Government, too, has been allowed to secure a position in the eastern portion of the grounds, the Japanese Commissioners having selected a site, 250 x 300 feet, on the hill south of the Machinery Building and close to two important exposition concessions, the "City of Jerusalem" and "Tyrolean Alps." It seems probable that other foreign Governments will be accorded the same privilege should they so desire. The majority of the foreign Government and Colonial buildings, however, will be in the western section, the ground of which gradually rises from Skinker Road and is broken by low hills.

Administration Building.

West of Skinker Road and north of Forsyth avenue—which cuts the former at right angles—are located the permanent buildings of Washington University, which have been leased for three years by the Exposition Company. A gentle slope from the railway station on Skinker Road leads to the Administration Building—located on a plateau—and is now occupied by the executive officials and clerical force of the various divisions of the Exposi-

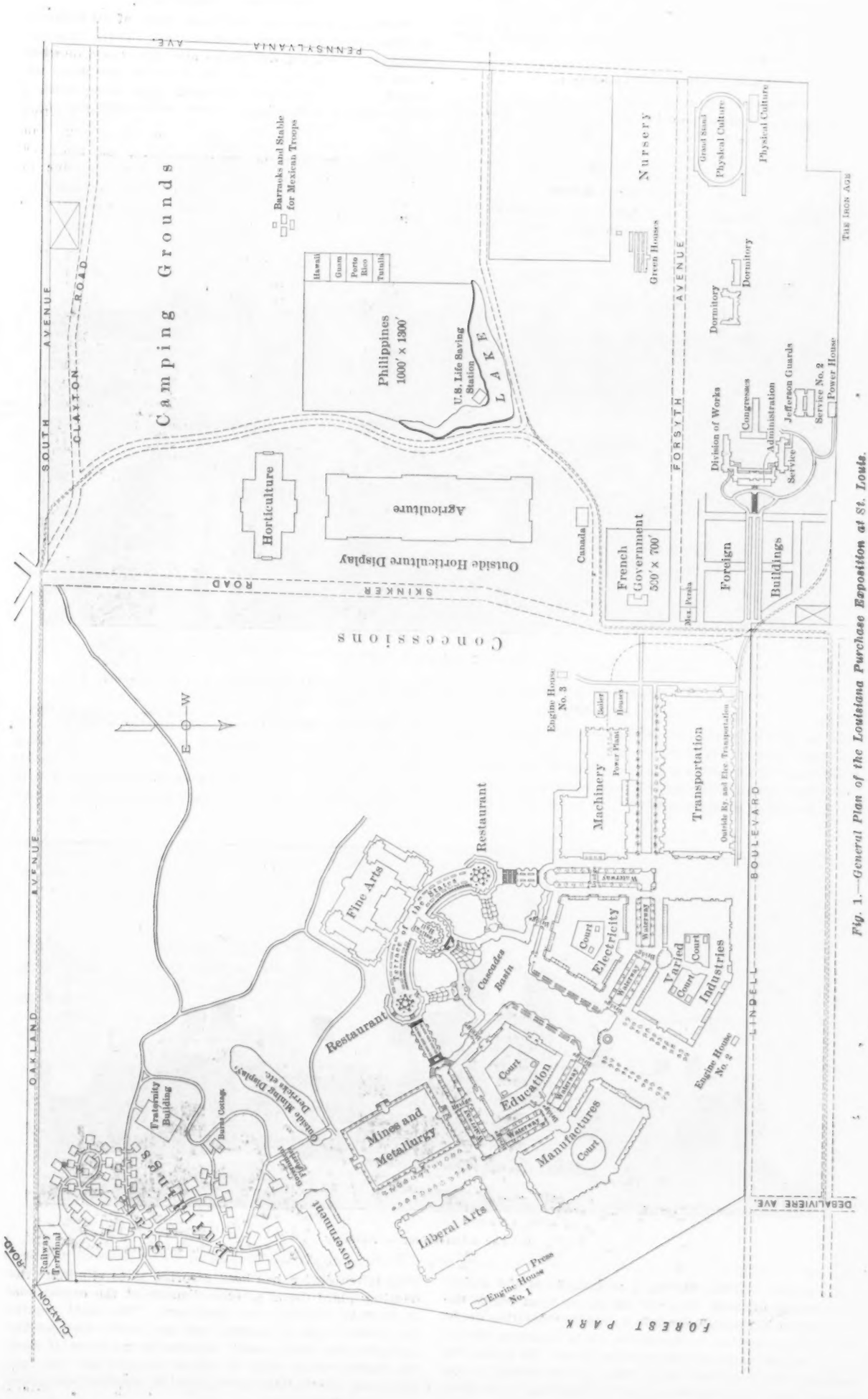


Fig. 1.—General Plan of the Louisiana Purchase Exposition at St. Louis.

tion. This building, or series of buildings rather, for there are five large buildings at present, and there will be more, valued at about $800,000, are built of pink Missouri granite, with Bedford, Ind., limestone trimmings. The style is Tudor Gothic. The structures are fire proof and contain over 50 large office rooms.

Inauguration of Exposition.

The administration authorities have determined that the Exposition will be opened to the public April 30, 1904, just one year from the dedication for which preparations are now making. Because of the enormous amount of preliminary labor and the many difficulties encountered, doubt has recently been publicly expressed as to the ability of executing all necessary work by the time set by the management. When the great magnitude of the undertaking and the wide scope of the plans upon which the Exposition is founded are taken into consideration doubt naturally arises as to the ability to accomplish the almost endless tasks within another year. It should be remembered, however, that with the exception of the central Fine Arts Building and the buildings to be occupied by the Washington University after the Exposition, all structures are to be of a temporary character.

Character of Buildings.

With few exceptions the frame work of all buildings is wood, iron and steel entering very lightly into construction. Even the fish plates are being made of wood. Many iron bolts, nuts and rods, however, are being employed to give additional strength. The frame work is being covered with plaster casts, technically known as "staff," which is a composition of plaster of paris, incorporated in it being a quantity of low grade fine hemp fiber. The staff models are made of clay and the molds of glue. The completed plaster casts are protected with a coating of sizing, and subsequently painted ivory white. This latter device has been resorted to to eliminate the dazzling glare found so objectionable at the expositions at Buffalo, Chicago and elsewhere. The casts require but a short time to harden, and are readily and quickly applied to the frame work. Because of the material used, the facility with which it can be handled and the fact that many contractors are engaged in construction makes

Fig. 2.—View Across Grand Basin, Looking West.

Education Building, first on right; Electricity Building, west, and Machinery Building in the distance.

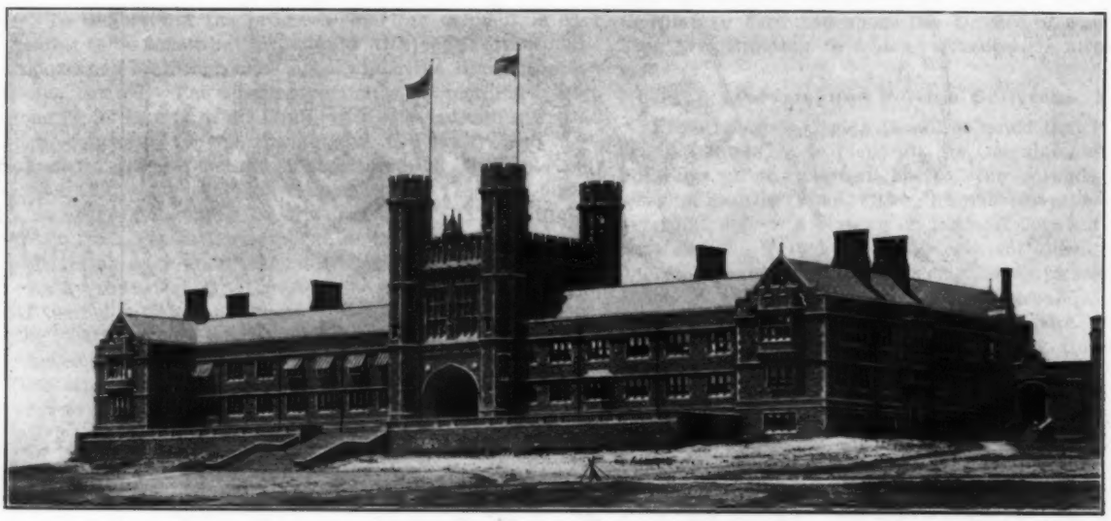


Fig. 3.—The Administration Building.

it evident that much building can be accomplished in an incredibly short time.

Delay Unlikely.

So far as the buildings are concerned, therefore, there seems little reason to believe that any delay from this source will cause a further change in the date of opening.

Machinery Building.

The Machinery Building, which has been erected at a cost of $496,957, is 525 x 1000 feet. The principal architectural feature is its many graceful towers. From the ground plan and the general view a comprehensive idea of the building is readily obtained. The main portion ex-

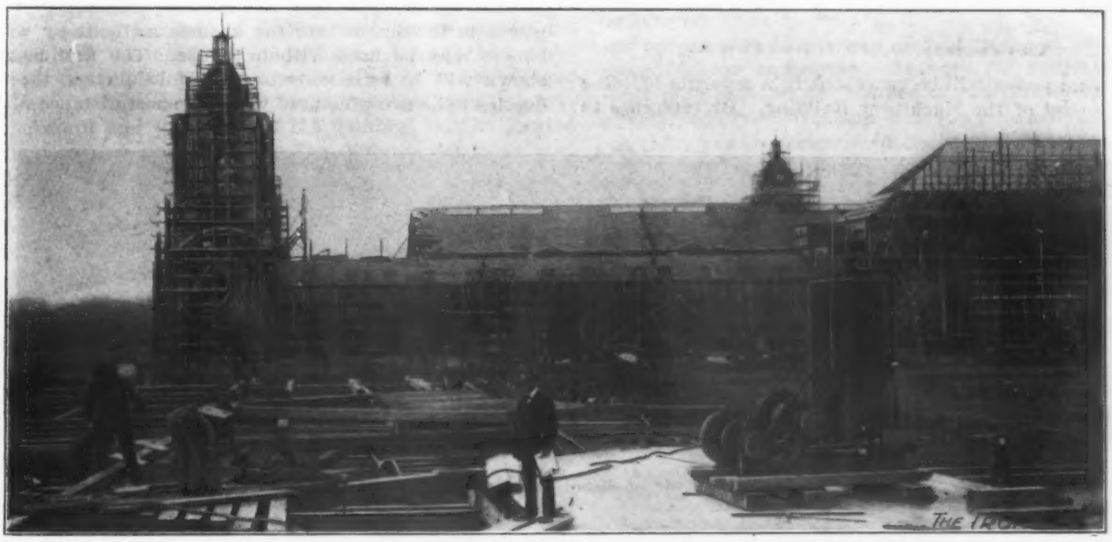


Fig. 4.—Transportation Building, Looking South.

Framing the Transportation Building. In foreground, northeast corner of Machinery Building.

It is possible, however, that delay in the installation of exhibits, especially those from foreign countries, may defeat the plans of the Exposition management. The energetic policy, however, which has been inaugurated will probably overcome such difficulties, and from present in-

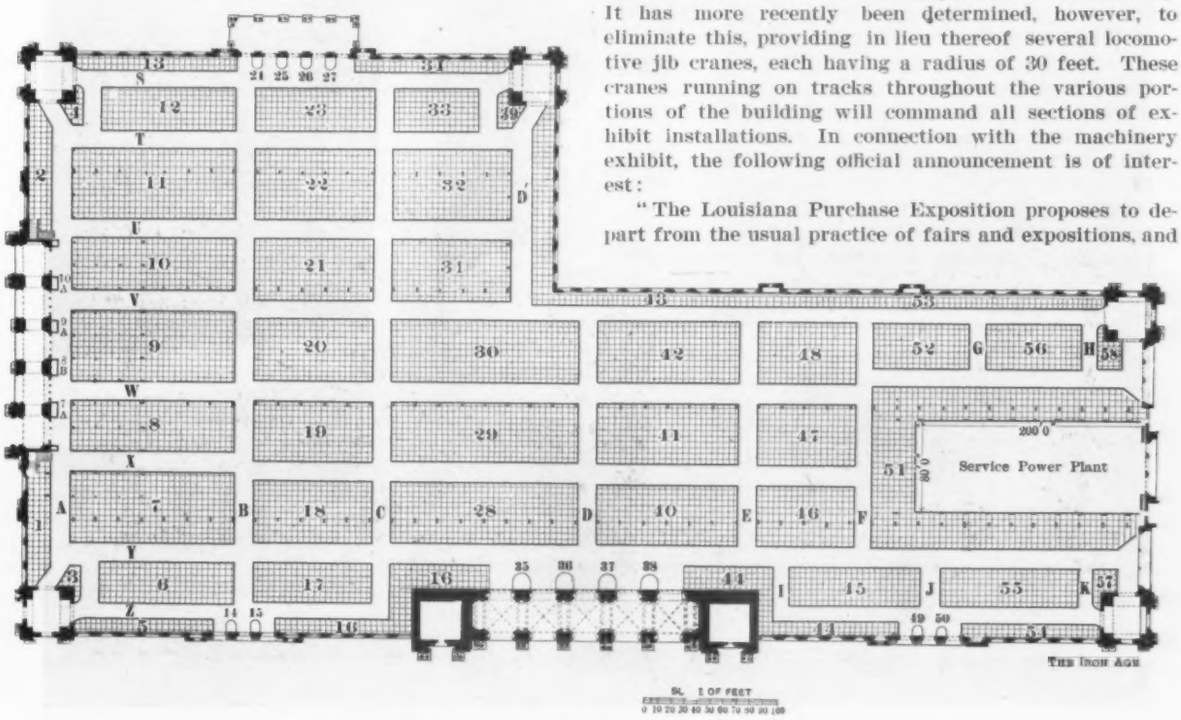


Fig. 5.—Installation Plan for Machinery Building.

dications there is reason to believe that the management will carry out their onerous tasks in the appointed time. Much, however, depends upon the co-operation of exhibitors, and all who wish a prompt and successful opening and who contemplate taking space will aid the management by making early applications. They will also secure to themselves a priority of claim for position. No allotments, however, will be made until November, 1903.

tends from the principal entrances from west to east, and on either side are what may be termed north and south wings. On the southeast, however, there is an L, which greatly increases the area. According to the original design an electric traveling crane would command the entire length of the central portion of the building. It has more recently been determined, however, to eliminate this, providing in lieu thereof several locomotive jib cranes, each having a radius of 30 feet. These cranes running on tracks throughout the various portions of the building will command all sections of exhibit installations. In connection with the machinery exhibit, the following official announcement is of interest:

"The Louisiana Purchase Exposition proposes to depart from the usual practice of fairs and expositions, and to make no charge for exhibit space, and—within the discretion of the Director of Exhibits, and the Chief of the Department directly interested—to abolish charges for power, light and such facilities as may seem reasonably necessary for the best presentation and operation of a desirable exhibit. Furthermore, this Exposition Company will endeavor to make the most favorable freight tariff possible with the transportation lines; it will place

railway tracks to and within the principal exhibit buildings, furnish cranes and hoists when necessary for the expeditious and economical handling of heavy items, and do in general whatever may be found proper for the comfort and convenience of its exhibitors or for their protection against petty extortions by carting and transfer companies, or installation agencies or the like."

To Generate 40,000 Horse-Power.

Steam power will be generated in a separate building to the west of the Machinery Building. By reference to the ground plan it will be noted that this power house is located almost in the center of the Exposition grounds. Here storage capacity for 5000 tons of coal will be provided, and it is anticipated that the daily consumption will be from 400 to 500 tons. It was originally intended to obtain upward of 11,000 horse-power from city stations. More recently, however, it has been deemed expedient for the Exposition to be entirely self contained. It has therefore been designed to generate on the Exposition grounds 40,000 horse-power. The three cascade pumps will require 2000 horse-power each, a total of 6000 horse-power; these pumps will work against a head of 152 feet. For incandescent lighting it is stated that 10,000 kw., and for arc lighting 1500 kw. will be required. For operating machinery in the various buildings 3000 kw., peak load, will be provided. For the sewage pumps working against a head of 60 feet, 1000 horse-power is necessary. For the use of exhibitors theoretically 20,000 horse-power will be required, but probably in actual practice only about 7500 horse-power will be necessary. Finally, 4000 horse-power will be generated for other purposes.

One of the principal features in generating steam power is to demonstrate the various methods by which boilers may be fired without smoke. The first method shown will be by a consumption of briquettes, the briquettes to be manufactured within a short distance of the power house. The second method will be with the use of crushed coal; the fuel fed by mechanical stokers. The third method will illustrate the jetting into the fire of pulverized coal or coke. The fourth method will illustrate the consumption of producer or fuel gas in engines and under boilers, three different fuels being consumed in producing the gas. The fifth method is the use of crude oil as fuel.

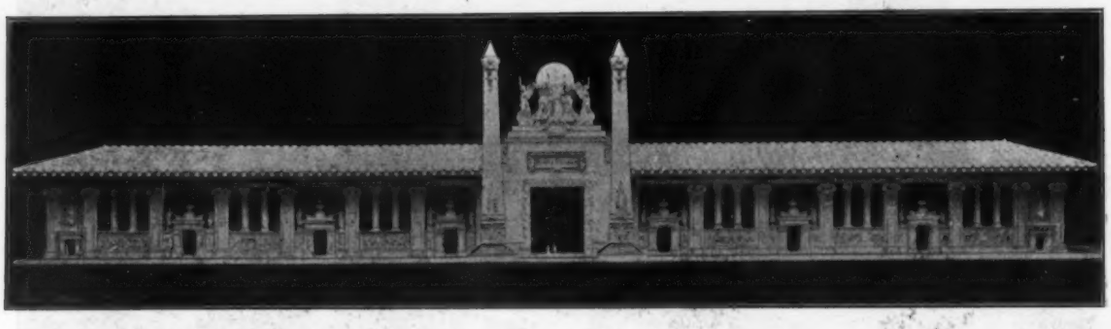


Fig. 6.—Façade of Mines and Metallurgy Building.

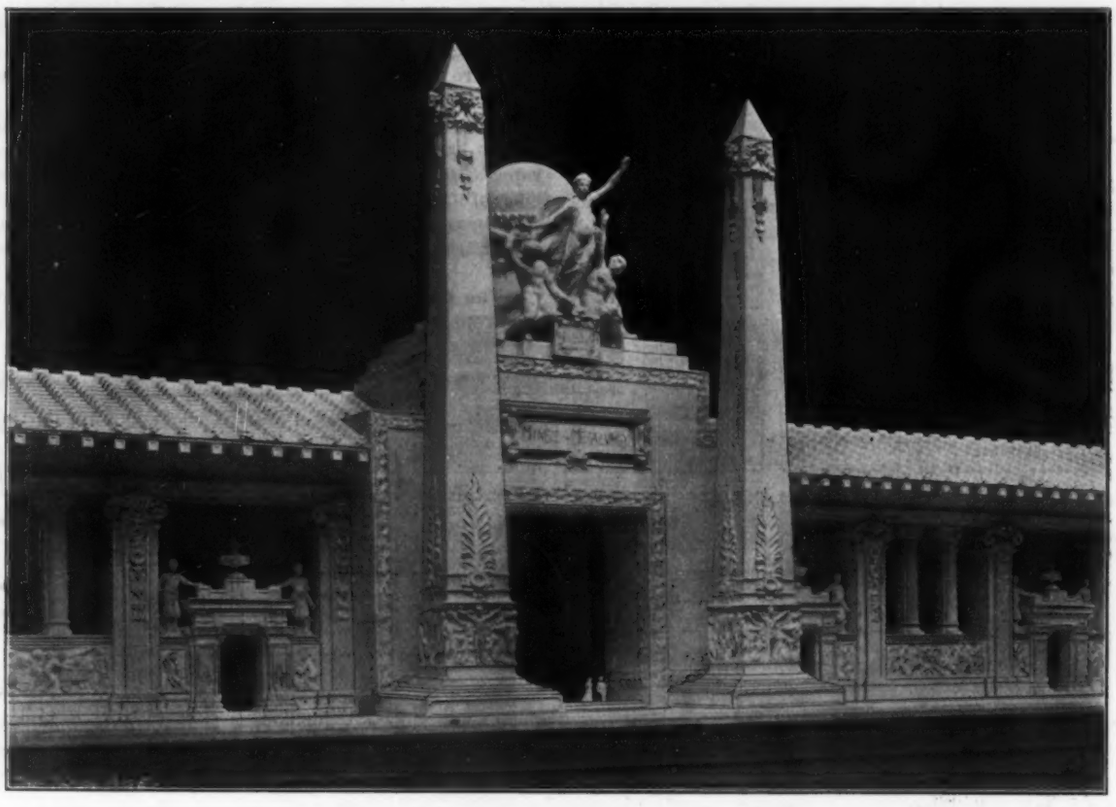


Fig. 7.—Main Portal, Mines and Metallurgy Building.

Mines and Metallurgy Building.

The Mines Building covers an area of 9 acres, being 525 feet wide, 750 feet long and 60 feet high to the cornice. It will cost $500,000. No galleries have been provided for exhibition purposes, hence all the in-door exhibits will be arranged on the main floor. The building is divided into eight nearly equal oblong parts, over each of which is a glass cover and ventilated arcade, 30 to 50

feet wide, which will furnish abundant light for the exhibits below. The walls of the building on three sides are set back 18 to 20 feet from the façade, leaving an intervening covered space or loggia, which can be utilized for exhibits of a special character. The base of this façade, or outer screen, consists of sculptural panels illustrating quarrying, mining and metallurgical operations.

Bordering the building along the southwest side a space 200 feet wide by 750 feet long has been set aside for working exhibits in mining, metallurgy and electro chemistry. Tunnels for underground mining will penetrate the hill which faces the building on the southwest side. On an extension of this out of door area, lying to the south and southwest of the building, will be located the ore and quarry yards, the derricks for deep well drilling outfits, equipment for placer mining and kindred exhibits in operation. The area of this adjacent ground for working exhibits is from 10 to 12 acres, making the total area provided for the mining, quarrying and metallurgical exhibits about 20 acres.

Electricity Building.

The Electricity Building covers approximately an area of 350,000 square feet, having an extreme width of 700 feet and extreme depth of 600 feet. It has been erected at an expense of $399,940. The building is entirely surrounded by water, and no other structure is within 300 feet of its approaches. The design is a bold treatment of the Corinthian order. The columns are carried well down toward the ground to give hight to the façades, which are accentuated by elevated pediments and tower effects from the four main entrances and at the corners. Double columns are used effectively on the façades, and far enough apart to give ample space for the placing of statuary. On two sides of the building are loggias. One of the prominent features is an open central court, entirely surrounded by colonnades, the court being designed as a resting place for visitors. A plan has been adopted for lighting the building at night by which it will seem to be incandescent. This is accomplished through the placing of incandescent lights on the inside of the column shafts, the light being directed onto the façades, from which it is reflected, giving the glowing appearance. The more massive exhibits will be given space in the east and west corridors, while the heavy machinery will be brought together in the north corridors. A tentative plan provides for the placing of the foreign exhibits in the northeast quarter of the building. This arrangement will mass the more impressive foreign and domestic exhibits at points admirably suited for a ready comparison without throwing the home products in direct contrast with those of participating nations. In the east, south and west corridors the exhibition space will be laid off in three long sections, separated by wide central aisles and less pretentious side passages, cross connecting spaces being left opposite the side and corner entrances. Few obligatory aisles have been laid out in the northwestern section of the building where the heavy operating units, switchboards and controlling appliances will have space. These exhibits will be placed with the idea of rounding them into an imposing and effective display rather than of setting them relative to a predetermined system of platforms and passage ways.

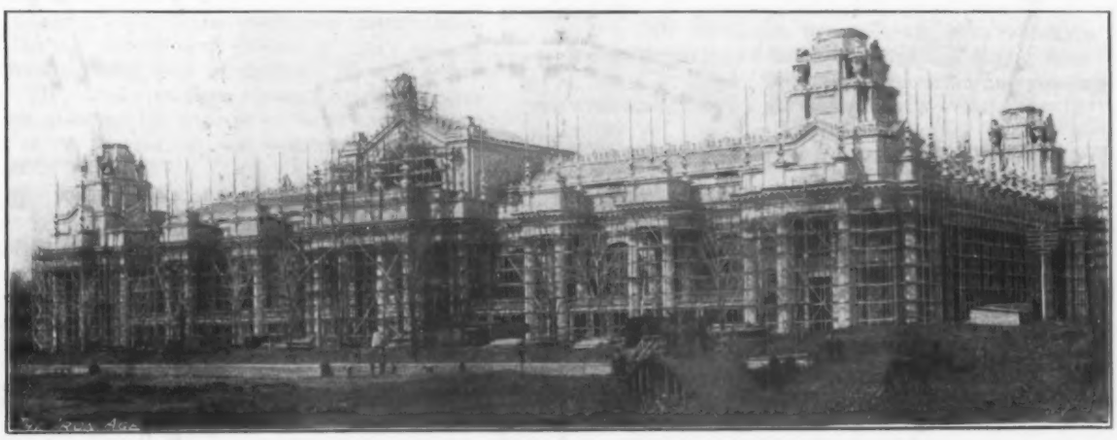


Fig. 8.—Electricity Building.

Transportation Building.

The Transportation Building is 525 x 1300 feet, covering approximately 16 acres. It is thus the largest building in the "main picture." The great arches that constitute the chief features of the several façades indicate its purposes, those at the ends and to the middle of the long façades suggesting entrances for railways. The floor plan provides for 4 miles of railway tracks for the display of locomotives and cars of every description; for marine transportation exhibits, automobiles, road and farm vehicles, carriages and cycles. Saddlery and harness are also alloted another group.

In the railway group are rolling stock, bridges, tunnels, construction and maintenance equipment, brakes, signals, shops, snow plows, yards, stations, freight houses and terminal facilities, electric and other railways. Material and equipment used in the mercantile marine form another group, and the equipment of the naval service another. The last group is devoted to aerial navigation, showing balloon construction, aerial voyages, military ballooning, including transport wagons and apparatus and dirigible air ships.

Manufactures Building.

The Manufactures Building is of Corinthian design, and covers an area of about 14 acres. It has a frontage to the north of 1200 feet, with a depth of 525 feet on the main boulevard. Imposing entrances are placed at the centers of the main façades, and a tower 400 feet high is at the angle of the main elevation facing north. This prominent feature gives an appropriate balance to a tower of corresponding hight on the Varied Industries Building immediately west. Corner entrances have also been provided. Graceful groups of sculpture ornament and accentuate the four main entrances on the sides. The roof has been designed to give light and ventilation, and at the same time to avoid the extensive and troublesome skylights frequently used on structures of this size and kind. Each façade of the building presents an open colonnade. This affords a passage way for visitors, and at the same time offers a shadow relief that enhances the beauty of the design. The interior of the building has been laid out with courts of simple and pleasing proportions, with sufficient decoration to relieve the uniformity of the inclosing walls. Opportunity for mural decoration has been effectively availed of on the outside walls back of the colonnades. The cost of the building is $850,000.

Liberal Arts Building.

The Liberal Arts Building, while one of the stateliest of the prominent buildings, is of especial interest at the moment as in it the dedication ceremonies will be held on April 30. It is 525 feet wide and 750 feet long, the cost of construction being about $500,000. The design is French Renaissance, with three entrances on the main

façade. A polystyle and exterior loggias painted with mural frescoes on old gold background suggest the noble palaces of the days of the Roman emperors. In June, 1903, the Saengerfest of the North American Saengerbund and in September the International Press Congress will be held here.

Varied Industries Building.

The Varied Industries Building covers an area of 569,000 square feet, and includes two open courts with a combined area of 121,000 square feet; which leaves a net area under roof of 448,000 square feet, or 10.3 acres. The bined area of 121,000 square feet, which leaves a net feet. The exterior shows an almost continuous line of colonnade. At the angle of the north front, forming its central feature, is a tower 350 feet in hight; at the re-

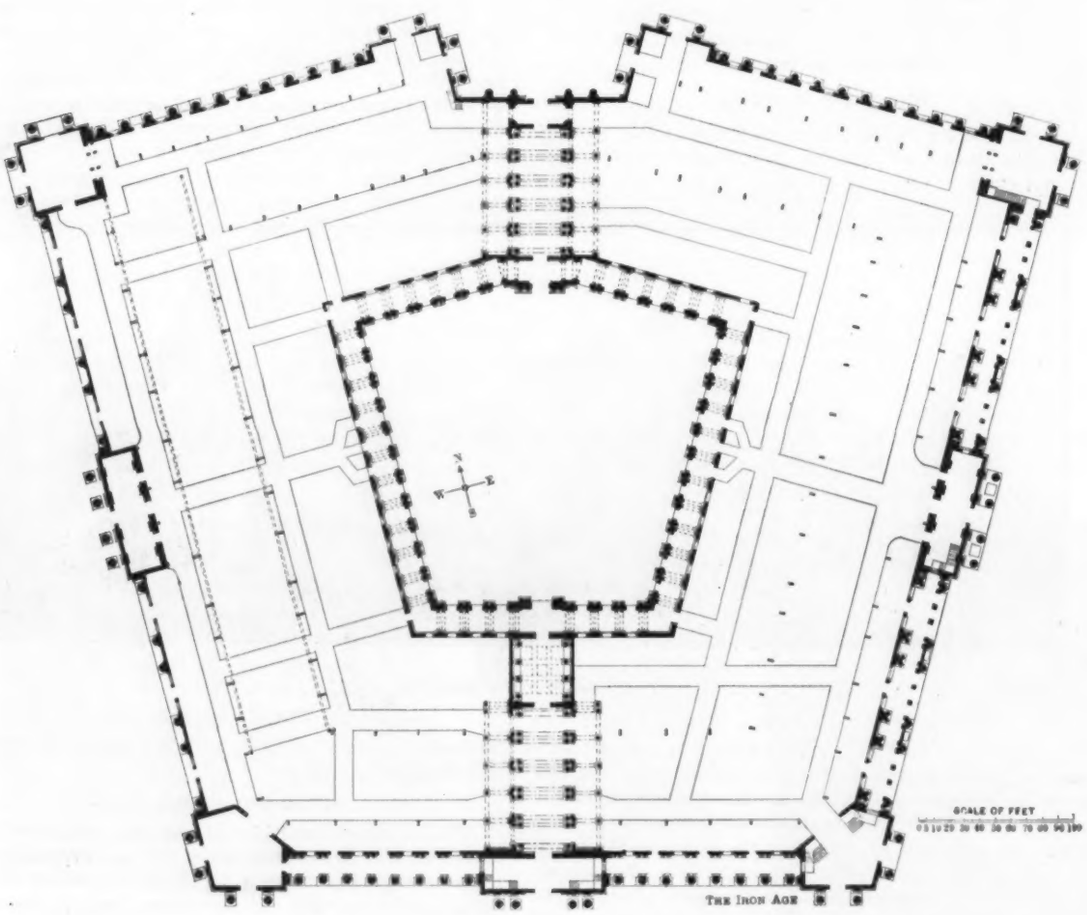


Fig. 9.—Installation Plan for Electricity and Machinery.

entering angle of the south front, opposite the tower, is a dome 160 feet in hight. Corner pavilions, monumental main entrances at the east and west fronts, smaller turrets flanking the main tower and dome, a portico in front of the main tower and a colonnaded screen in front of the dome complete the design of the building. Cost of the building will be $604,000.

Education Building.

The Education Building was the first to be completed and cost about $350,000. It is of Corinthian design, 525 x 758 feet, and covers about 6 acres. The principal entrances to the building are on its axes, and somewhat resemble the form of the triumphal arch. At each angle of the exterior is a pavilion, forming a supplementary entrance, and these are connected by a colonnade of monumental proportions. The four elevations are harmonious in character, varying only as required to accommodate the design to the general ground plan. The liberal use of sculpture enhances the architectural effect of the classical façades, and the screen wall behind the colonnades gives opportunity for a liberal display of color as a background to the clear cut outlines of the Corinthian columns, which is availed of effectively by the mural decorator. An interior court following the general outline of the building in form and style occupies the center space, forming a plaisance or garden of attractive arrangement and proportions.

Fine Arts Building.

In some respects the Fine Arts Building is the most important of the various Exposition structures in that even the temporary buildings are of a more substantial character, being built of brick and stone. The dimensions of the three united buildings are 450 x 830 feet. The central pavilion, which is 166 x 348 feet, is of fire proof construction. It contains a large hall for statuary, 94 x 157 feet, with galleries on either side for paintings and other precious art works. The side pavilions are each 200 x 422 feet, containing many galleries. The buildings inclose, on three sides, a beautiful court, 262 x 530 feet. The site is upon the wooded plateau, 60 feet above the general level of the main group of buildings, just behind the Festival Hall and Terrace of States above the Cascade Gardens. The cost of the Fine Arts Building exceeds $1,000,000.

Harrisburg Notes.

HARRISBURG, PA., April 18, 1903.—The output of the Central Pennsylvania blast furnaces was this week curtailed only by the lack of coke, and in some cases of coal. All but one or two are in operation and those not working are off only for repairs. The coke receipts were particularly light at Steelton, where the five furnaces of the Pennsylvania Steel Company all turned out limited products. Anthracite coal is also scarce at Steelton. Some of the mills complain of poor car service, notably Steelton, and shipments of finished material have been somewhat delayed. Orders for street rails at Steelton are unusually heavy and large quantities are being turned out. Machinery of all kinds is in demand and every manufactory in this territory reports orders increased over those of last year. The Harrisburg Foundry & Machine Works never had so many orders for engines at

one time in their history. The Harrisburg Boiler & Mfg. Company have large orders on hand and are seeking little new business on account of delay in the rebuilding of their main building, which was burned some months ago, on account of failure to receive supplies.

The National Association of Manufacturers.

NEW ORLEANS CONVENTION.

Our report last week made but a brief reference to the proceedings on Wednesday morning.

Labor Commissioner Carroll D. Wright's address was received with enthusiastic applause, despite the fact that the great majority of those present were in favor of more strenuous methods of handling the labor question than were advocated by him. Perhaps the hope was entertained that his conservative views might be influential in modifying the disposition of labor leaders to pursue an offensively aggressive campaign against the rights of both employers and free labor. He characterized some of the methods of labor unions as "damnable." Such language coming from a man who believes in labor unions as an essential force in social progress should have great weight in bringing about better conditions in their management. At the conclusion of Colonel Wright's address he was given a rising vote of thanks. He was subsequently complimented even more strongly by the adoption of a motion ordering his address to be printed both in the report of the proceedings and separately for general distribution.

Declaration of Principles.

Richard Young, chairman of the Committee on Resolutions, reported the following declaration of principles and resolutions on the labor question, which had been adopted by the committee:

We, the members of the National Association of Manufacturers of the United States of America, in convention assembled in the city of New Orleans, April 15, 1903, do hereby declare the following principles which shall govern this association in its work in connection with problems of labor:

1. Fair dealing is the fundamental and basic principle on which relations between employees and employers should rest.

2. The National Association of Manufacturers is not opposed to organization of labor as such, but it is unalterably opposed to boycotts, blacklists and other illegal acts of interference with the personal liberty of employer or employee.

3. No person should be refused employment or in any way discriminated against on account of membership or nonmembership in any labor organization, and there should be no discrimination against or interference with any employee who is not a member of a labor organization by members of such organization.

4. With due regard to contracts, it is the right of the employee to leave his employment whenever he sees fit, and it is the right of the employer to discharge any employee when he sees fit.

5. Employers must be free to employ their work people at wages mutually satisfactory, without interference or dictation on the part of individuals or organizations not directly parties to such contracts.

6. Employers must be unmolested and unhampered in the management of their business in determining the amount and quality of their product, and in the use of any methods or systems of pay which are just and equitable.

7. In the interest of employees and employers of the country no limitation should be placed upon the opportunities of any person to learn any trade to which he or she may be adapted.

8. The National Association of Manufacturers disapproves absolutely of strikes and lockouts, and favors an equitable adjustment of all differences between employers and employees by any amicable method that will preserve the rights of both parties.

9. The National Association of Manufacturers pledges itself to oppose any and all litigation not in accord with the foregoing declaration.

Whereas, In order to meet in a collective, scientific and effectual manner the present industrial conditions arising from the organization of labor, it is necessary that there be thorough organization among employers of labor in kindred crafts,

Resolved, That the president of the National Association of Manufacturers appoint a committee of seven, with power, who, with the president and secretary, shall constitute a standing committee on the Organization of Employers.

This committee, at the request of any five members of this association, employers of kindred trades, shall call a meeting of employers of such trades for the purpose of forming an association, the general object of which will be to secure and preserve equitable conditions in the workshops of the members whereby the interests of both employer and employee shall be properly protected; and be it further

Resolved, That the president and secretary of this association be, and they are hereby, instructed to co-operate with the officers of such organizations of employers, to form a permanent central organization that will tend to form a clearing house for ideas and provide means of co-operation on matters of common interest.

Whereas, The lawless and vicious element among the membership of the labor organizations seek to control the industries of our country by intimidation and violence directed against employers and employees, and also undertake to coerce newspapers, political parties and administrative and judicial authorities; now, therefore, be it

Resolved, That the National Association of Manufacturers view with apprehension the unrestricted excesses of the radical unionists—that we warn the nation that if these tendencies be allowed to go unchecked a grave industrial disturbance will surely result, and we call upon the good sense and courage of the American people to condemn in no uncertain terms this widespread attack on our political as well as our industrial rights.

Whereas, An alarming tendency has arisen on the part of organized labor to infringe on the just rights and privileges of the individual as guaranteed by the Constitution and laws of our country; and

Whereas, In several localities there has arisen on the part of the independent workmen a movement toward the organization of such workmen to protect themselves against the methods of coercion and intimidation used by the unions;

Resolved, That the National Association of Manufacturers of the United States of America, in convention assembled, heartily commends such organizations of independent workmen to secure and maintain their rights, and that this association hereby pledges its moral support to such efforts.

After a full discussion, in which the chief speakers were D. A. Tompkins of North Carolina and Mayor Samuel M. Jones of Toledo, Ohio, the declaration and resolutions were adopted with an amendment providing that the Committee on Organization of Employers should be named by the Committee on Nominations and elected by the convention.

A resolution which had been offered by C. N. Fay of Chicago, urging that all applications for patents should be made part of the public records of the Patent Office, was favorably reported by the committee, but was laid on the table by a heavy majority.

A resolution which had been presented by Geo. P. Altenburg of Cincinnati, calling upon the United States to re-establish harmonious trade relations with Russia and terminate the war of reprisals between the two countries, was favorably reported by the committee, but on motion was referred to the standing Committee on Legislation.

WEDNESDAY AFTERNOON.

The Committee on Legislation, through the chairman, George H. Barbour of Detroit, submitted a brief report stating that they had twice gone to Washington to urge the defeat of the eight-hour law, which had finally been accomplished. They had also been active in promoting the passage of the law creating the new Department of Commerce and Labor, as well as looking after other important legislation.

Revision of the Tariff.

The Resolutions Committee reported the following resolution favorably.

The National Association of Manufacturers, recognizing the existence of a widespread popular conviction that the present tariff laws of the United States afford undue advantage to certain special interests, and fearing that this conviction may, at any time, develop into a political agitation of the first magnitude, threatening our entire protective system and our domestic prosperity, and, furthermore, well knowing that the growing tendency to retaliatory tariff legislation on the part of European governments seriously menaces our foreign export trade, and believing that a well considered and just revision of our present tariff at the hands of the party responsible for it, resulting in a gradual reduction of duties to the minimum rates consistent with the principle of protection to American wage standards, would minimize the danger from tariff changes at home and abroad, and, finally, realizing the breadth and complexity of the interests involved at the time and special knowledge necessarily required for the preparation of a wise and complete tariff schedule, does hereby respectfully urge upon the Administration at Washington, through its new Department of Commerce and Labor, at the earliest possible day, to take the initiative, so far as it lawfully may, in preparing for tariff revision, by expert examination of and report upon all the conditions of foreign and domestic trade touching each and every dutiable article, with such recommendations to Congress as to rates of duty thereon as may be suggested by the accurate and public knowledge necessarily resulting.

It was laid over until Thursday morning and ordered printed.

The committee reported back without recommendation a resolution in regard to the employment of convict labor in competition with free labor.

On motion of A. B. Farquhar of York, Pa., a substitute for this resolution was adopted, as follows:

Resolved, That the National Association of Manufacturers, in convention assembled at New Orleans, on April 15, does hereby recommend that prisoners and convicts be employed in working on the public highways and in the making of road material and crushing stone for use on the public highways, and the care and construction of the buildings and grounds where they are permanently confined, all of such labor to be performed in the communities which are taxed for their conviction and support.

The Committee on Constitution submitted a favorable report on a resolution providing for the appointment of a committee of six to compile and revise the by-laws, which was adopted.

The Metric System.

The secretary presented an elaborate report on the metric system, which had been prepared by a committee headed by ex-President Theo. C. Search. The canvass of members showed that the sentiment of the association was overwhelmingly against the general adoption of the metric system. In reply to a question as to whether it would benefit them in their foreign trade 264 answers were received. Sixty were in the affirmative, 175 in the negative and 12 noncommittal. Other questions of the same character were answered in the same manner.

Mr. Tompkins said they could talk about the metric system for two years and know little more about it than now. To adopt it to the exclusion of the American system would cause great damage to trade. The system would not be changed for 25 years, if it was changed then. If ever a change was made it would be gradual. He moved that the report be printed and laid over for action until next year.

This motion was carried.

Favoring an Elastic Currency.

Thomas R. Kackley of Indianapolis read a paper urging action by Congress in favor of a more elastic currency. He pictured the advantages to trade to result from a more elastic currency. He said, in part:

"Every man here has seen an advance of from 40 to 50 per cent. in the money rates in the past year—that is, from 3½ and 4 per cent. to 5½ and 6 per cent. We are paying this increased interest because there is not enough flexibility in our currency to take care of the increased call for it; because our bond based currency, instead of increasing, actually decreases with the prosperity and increasing bank deposits of the citizens of this country. As the interest rate of money and your ability to command it as you need it is a most potent factor in the manufacturing business, just as important as the cost of labor and material, we have a right in fact we must insist, if we are to compete, that our currency laws be so drawn that the supply comes and goes in unison with the ebb and flow of the tide of demand."

At the conclusion of his address a resolution presented Tuesday was submitted with favorable report by the Committee on Resolutions, protesting against any further delay on the part of Congress in passing a law providing for a more elastic currency. The resolution was adopted without dissent.

Mr. Kirby's Scathing Attack on Union Labor.

A most severe arraignment of the vicious methods of labor unions was read by John Kirby, Jr., of Dayton, Ohio, who said at the outset that he proposed to call things by their right names. He presented a strong array of evidence showing the manner in which labor unions are interfering with the rights of citizens at large, preventing the youth of the country from learning trades and resorted to lawlessness to gain their ends during strikes. The paper, which was a long one, was listened to with deep interest, and over and over again its statements were applauded. It provoked a long discussion, a motion having been made to print it separately for distribution broadcast throughout the country. While it was strongly supported, the views of such conservatives as D. A. Tompkins of North Carolina, Willard Warner of Tennessee, J. F. Taylor of Ohio, Richard Young of New York and J. W. Van Cleave of Missouri impressed the convention. A substitute was adopted that the paper be printed in the proceedings.

THURSDAY MORNING.

Addresses were made by two foreign consuls at New Orleans, Mexican Consul Portilla and Cuban Consul Yzaguirre. Both expressed great pleasure that such close relations existed between the countries they represent and the United States. The Mexican Consul, being more conversant with the English language, made an extended address in which among other things he dwelt on the necessity of American firms sending representatives to Mexico with some knowledge of the customs, habits, tastes and language of the inhabitants.

Frederick W. Taylor, chief of the department of agriculture of the Louisiana Purchase Exposition, addressed the convention on the importance of making the very best possible exhibition of American goods at St. Louis in 1904.

Charles A. Carlisle of Indiana, chairman of the Committee on Constitution, brought up the subject of establishing a graded membership fee in place of the present uniform fee of $50 per year, but after a protracted discussion a motion was adopted instructing the committee to investigate the subject further and report at the next convention.

A telegram from the Manufacturers' Association of the Northwest, dated Portland, Ore., was read. It strongly indorsed President Parry's views on the labor question.

Tariff Revision Not Favored.

A resolution relative to tariff revision, which had been carried over from the previous day, was discussed at great length. C. N. Fay of Chicago, the author of the resolution, and A. B. Farquhar of York, Pa., made strong speeches in favor of the resolution, while S. O. Bigney of Massachusetts and others vigorously opposed it, urging that it was not wise to take such action during the flood time of prosperity. The resolution was laid on the table indefinitely by a very large majority.

Resolutions were adopted thanking the New Orleans Progressive Union, James W. Porch and other local committemen, as well as the citizens generally, for the delightful manner in which the members of the convention had been entertained; thanking the New Orleans press for the attention given to the convention; urging upon Congress the necessity of the pneumatic tube service for the transmission of mails at New Orleans; authorizing the appointment of a committee to look into the question of taking out a charter for the association granting it broader powers and to take a letter ballot on the plan decided upon; that all resolutions shall hereafter be sent to the secretary one month before the session of the convention, and that they be printed and copies sent to the members; that members in different cities should hold meetings once a month to discuss matters of interest, sending reports of the discussion to the National Association, and at the same time co-operate with boards of trade and chambers of commerce having manufacturing committees; recommending the Executive Committee to investigate and devise a plan to provide for membership of State associations.

F. C. Nunemacher of Louisville, Ky., read a very bright paper which was to some extent a review of the discussion of the labor question in the convention. He endeavored to show that the members of the association were not seriously divided on this subject. He deprecated such action as might at some time lead to a general lockout of the employees. The point at issue could be gained, but at a fearful cost. Speaking with experience gained in strikes, he said an employer must be firm but conciliatory. He must not drive. The watchword should be fair play to all.

A. V. Dee of Philadelphia submitted two papers which were read by the secretary. One set forth the advantages to be obtained by an organization of the employer with his employees. The other favored the establishment of commercial schools under Government auspices to instruct young men in languages and in methods of doing business in foreign countries. No action was taken.

Election of Officers.

The Committee on Nominations, through John Kirby, Jr., chairman, made a report which met with such favor that all the parties named for the respective positions were unanimously elected, as follows:

President, David M. Parry of Indianapolis.
Secretary, Marshall Cushing of New York.
Treasurer, F. H. Stillman of New York.

Committee to organize employers engaged in kindred trades and to canvass the question of taking out a charter for the National Association:

Wm. H. Pfahler of Philadelphia.
E. F. Du Brul of Cincinnati.
A. H. Bullard of Bridgeport, Conn.
Wm. H. Pierce of New York.
Wm. McCarroll of New York.
John Kirby, Jr., of Dayton, Ohio.
Wm. M. Taylor of Indianapolis.

Committee to Revise the Constitution and By-Laws:

E. F. Du Brul of Cincinnati.
A. H. Bullard of Bridgeport, Conn.
Wm. H. Pierce of New York.
Wm. McCarroll of New York.
John Kirby, Jr., of Dayton, Ohio.
Wm. M. Taylor of Indianapolis.

The former treasurer, Hamilton Carhartt of Detroit, declined re-election because of his consistent attitude for years in favor of conciliatory methods in dealing with labor.

The roll of States was called for and vice-presidents were named by the delegations as follows:

Alabama, S. M. Jackson, Birmingham.
Connecticut, A. H. Bullard, Bridgeport.
Georgia, G. Gunby Jordan, Columbus.
Illinois, C. Norman Fay, Chicago.
Indiana, Charles Arthur Carlisle, South Bend.
Kentucky, F. C. Nunemacher, Louisville.
Louisiana, Albert Godchaux, New Orleans.
Maine, T. S. Laughlin, Portland.
Massachusetts, George T. Coppins, Boston.
Michigan, James Ingliss, Detroit.
Missouri, J. W. Van Cleave, St. Louis.
New Hampshire, E. B. Pike, Pike's Station.
New Jersey, E. F. Hartshorn, Newark.
New York, William McCarroll, New York.
North Carolina, D. A. Tompkins, Charlotte.
Ohio, J. A. Jeffreys, Columbus.
Pennsylvania, A. B. Farquhar, York.
Rhode Island, R. G. Hazard, Peacedale.
South Carolina, Ellison A. Smythe, Pelzer.
Tennessee, H. S. Chamberlain, Chattanooga.
Texas, John H. Kirby, Houston.
Vermont, Henry Fairbanks, St. Johnsbury.
West Virginia, George A. Laughlin, Wheeling.
Wisconsin, H. S. Smith, Milwaukee.

The contest for the honor of entertaining the next convention promised to be quite sharp, as a number of the speakers extolled the merits and advantages of several cities, but Pittsburgh was selected by an overwhelming majority.

The convention adjourned *sine die* at 2.30.

Entertainment of Visitors.

The entertainment features of the convention more than won the hearts of the visitors, who had heard much of Southern hospitality but had not previously had an opportunity to enjoy it. The chief functions provided for their enjoyment consisted of a reception in the palm garden of the St. Charles Hotel on Tuesday evening, a reception and smoker at Athletic Park on Wednesday evening, a boat ride on the Mississippi with a visit to the Illinois Central's great docks on Thursday afternoon and a reception at Mayor Capdevielle's residence on Thursday evening.

A large part of the arrangements for the entertainment of the guests was under the management of the Progressive Union, an association of the business men of New Orleans whose purpose is the advancement of the material interests of the city. United with them were many other prominent citizens who were anxious to assist with their time and means in contributing to the gratification of their visitors. Those who had any doubt as to the ability of New Orleans to entertain a convention so large as that of the National Association of Manufacturers had their misgivings thoroughly dispelled before the end of the first day.

The Federal Mill.—Three months or so ago, when the Federal Mfg. Company's sheet steel mill at South Chicago, Ill., was destroyed by fire, there was little expectation that the new mill, then in process of erection at Elyria, Ohio, would be completed in time to be of much service for this season; but by extraordinary effort in pushing the work of building and installation to completion, the new mill is in operation to-day. The new mill covers 5 acres of ground. Although at present the mill is only equipped for rolling cold steel, it is the intention to erect a building for rolling hot steel. The hot rolling building will be 80 x 300 feet. All sizes of steel, from 2 inches wide up to 16 inches, and in gauge from 16 to ⅜ inch, will be handled. The pickle house dimensions are 50 x 75 feet. Electric hoists and traveling devices convey the stock from this house to all points in the mill where it is rolled. The cold rolling department has a capacity of 75 tons a day. This building measures 20 x 80 feet. Stock up to 16 inches wide and in gauge from 0.010 to 0.250 is rolled, cut, straightened, slit and sheared. The cold drawing and wire flattening department is located in a building 80 x 140 feet. The annealing department is 60 x 80 feet and contains six Swindell furnaces fired by patent gas producers. The shipping room is 60 x 80 feet. All steel leaves this room in bright condition. The boiler room, 60 x 75 feet, is equipped with six tubular boilers, each of 150 horse-power. The stokers are automatic. The gas producing house, measuring 30 x 60 feet, is equipped with three machines for supplying gas to the annealing furnaces. The rotary shear in the shearing room takes stock ¼ inch thick and 26 inches wide in any number of strips. The equipment of the mill has been the special study of David B. Marwick, manager of the plant, who held an important position with the Illinois Steel Company before that concern were merged with other plants in the United States Steel Corporation. Later he was connected with the Morden Frog & Crossing Works in Chicago. Then he was superintendent of the Hart & Cooley sheet steel mills at South Chicago.

Contracts for the Western Electric Company's Buildings Placed.—Active preparations are being made for the erection of the Hawthorne plant of the Western Electric Company. S. A. Treat, the architect, reports that contracts for the piling have been awarded to the Sager Construction Company, for sewers to M. P. Byrne Construction Company, and for several buildings to the Falkenau Construction Company and the William Grace Company. The buildings included in the contracts are: Power house, 173 x 265 feet, with stack 250 feet high; machine shop, 150 x 821 feet; foundry, 176 x 402 feet; office building, 54 x 160 feet; pattern storage building, 54 x 220 feet; water tower, 47 x 47, 180 feet high, and cable plant, 250 x 550 feet. The aggregate value of the contracts thus far placed is $1,057,000. The piling required for the heavier structures is now being executed and steel for the various buildings is being delivered. While the buildings are to be of fire proof construction, protection against fire is provided by a complete system of sprinklers in addition to a local fire department, which is to be equipped with fire apparatus housed on the site of the plant and small hose carriages located at various points on the property. The sewers are being laid and sidewalks constructed. To facilitate the distribution of heavy material to the different buildings four railroad tracks have been laid. It is expected that within two weeks 300 men will be employed on the erection of the buildings. Contracts for other buildings will be placed soon, as the plans are rapidly nearing completion. The Belt Line Railroad divides the property, forming a boundary between Chicago and Cicero, so that some of the buildings will be within the limits of Chicago and others in the town of Cicero.

The Lehigh Valley Railroad are building 3 miles of track to extend their lines to the Lackawanna Steel Company's plant at Stony Point, Buffalo.

The Durability of Ingot Molds.

To steel makers the subject of the durability of ingot molds is one of perennial interest, as the average life of the molds makes quite a deep impression upon the cost sheets. A recent article in our contemporary, *Stahl und Eisen*, contains some interesting observations on this subject, which, we think, are well worthy of being brought to the notice of our readers. P. Reusch, the author of the article, passes over the subject of chemical composition as having been thoroughly threshed out and devotes his attention to the proper design and handling of these indispensable articles.

The shape of a mold has a great influence on its durability because it will suffer less from the constant heating and cooling and consequent expansion and contraction when all parts are heated up as evenly as possible and thereby undergo equal expansion. It is therefore a mistake to make the molds of equal thickness throughout. The dimensions must be so chosen that parts which are subject to a great and rapid rise in temperature and so have to take up much heat are sufficiently massive to absorb the same. By observing this rule it is possible to so design a mold that, after the ingot is cast, the differences in temperature of the various parts are extremely small. In a mold for ingots of the section *a b*

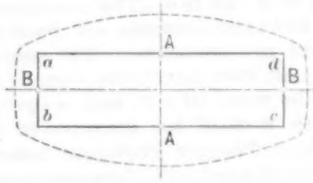


Fig. 1.

c d, Fig. 1, there is no doubt that at the points A A the greatest rise in temperature takes place, because at these points the steel remains longest molten and because they are nearest the vertical center line of the ingot. In the same way it is plain that the least heat is given off at the four points *a*, *b*, *c*, *d*, while at B B the mold will have rather more to take up. The iron therefore should be thickest at A A and thinnest at *a*, *b*, *c*, *d*, and we so obtain a mold section as shown by dotted lines in Fig. 1.

The observation was made many years ago that in large ingots for forgings, which usually are of a square, hexagonal or octagonal form, cracks could be avoided by making the inner walls slightly convex, as shown in Fig.

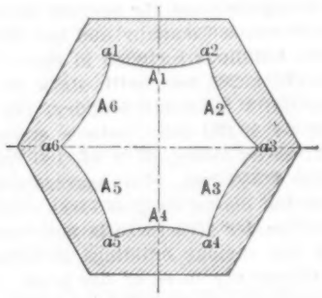


Fig. 2.

2. In a mold of such form the points A1, A2, &c., have to take up the greatest and points *a*1, *a*2, &c., the least amount of heat, the consequence being that if the walls are of equal thickness throughout, as shown in Fig. 3, after the ingot is cast the mold will be deformed, as shown in an exaggerated form in Fig. 4. The ingot will only touch the mold at the corners, while at points A1, A2, &c., there will be a space between the steel and the iron. This space is often sufficient to allow the ferrostatic pressure inside the ingot to come so strongly into play as to break through the scarcely solidified crust at A1, A2, &c., owing to its not being supported at the outside. This tendency to burst is increased by the fact that immediately after pouring the crust will be thicker at points *a*1, *a*2, &c., than at A1, A2, &c. If, on the contrary, the mold is constructed as shown in Fig. 2, not only will the expansion of the mold be regular but also the contraction and solidification of the ingot, because by strengthening the walls at parts where there is more

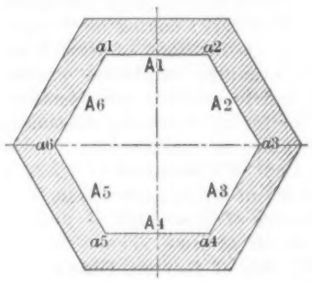


Fig. 3.

heat an opportunity is given to quickly get rid of it. A crust of even thickness throughout the whole area is formed, the ingot has less tendency to crack, and the durability of the mold is increased.

If the vertical section of a mold is considered in the same way it is plain that the lower part has to take up much more heat than the upper. At the beginning of the cast the former is subjected to great heat while the latter is still comparatively cold. In consequence of this, while the mold is being filled strains are formed in the same, which, although removed as the pouring progresses, are apt to cause cracks. Furthermore, the conical shape of

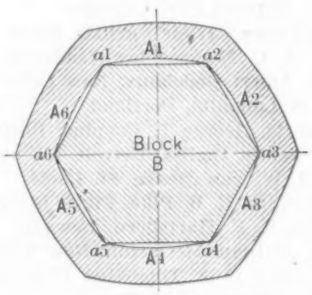


Fig. 4.

ingots causes the lower part of the mold to be subjected to more heat than the upper, a circumstance which has induced many steel works to make molds thicker at the bottom, or to cast a heavy band there. Experience has shown that a mold thickened as shown in Fig. 5 has a much longer life than one with walls straight from top to bottom. It has often been attempted to strengthen the molds at their lower ends by means of wrought iron bands, an experiment which in general has failed. Such bands cannot follow the constant contraction and expansion of the mold, and are therefore without influence on its durability, the same being true of rings cast in the body of the metal.

Regarding the handling of molds at the steel works, it makes quite a difference whether casting takes place in a trench or on cars. In the latter case the mold is quickly taken off the ingot, an operation which without the use of a stripper often occupies much time. The sooner the mold is relieved of its contents the less will it suffer by reason of the heat and consequent expansion. With the idea of subjecting the strongly heated mold to an evenly distributed cooling process, many steel works make a practice of placing the mold in water immediately after stripping. This procedure, which would at first thought seem fatal, has proven remunerative, for the reason that molds cooled off in the air are frequently subjected to drafts which cool them off more on one side than on the other, and in any case the interior cools off much more slowly than the exterior. These inequalities of temperature give rise to strains which sooner or later destroy the mold.

The following table shows results obtained at the Witkowitz Works before and after building their molds of the section shown in Fig. 5. The molds formerly used

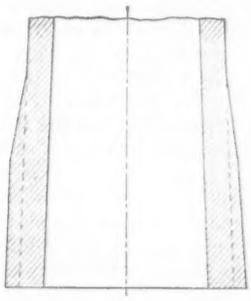


Fig. 5.

there were cast without any band; that is to say, the sides were straight from top to bottom.

Mold. Class No.	Weight. Pounds.	Walls of equal thickness. Number of molds broken up.	Average number of heats.	Walls thicker at bottom. Number of molds broken up.	Average number of heats.	Highest number of heats.
21	708	37	40.6	86	81.3	131
25	679	30	45.6	64	92.2	178
28	688	48	46.7	51	75.5	112
32	1,030	41	45	49	78.7	133
45	1,620	20	40.1	26	85.5	120
49	2,145	37	43.9	2	74.5	75
50	1,949	30	36.3	3	89	111
55	2,295	21	36.2	5	70.2	90
65a	2,749	40	36.3	12	57.5	70
67	3,860	37	45	4	73.5	81

These figures show that the durability is increased not less than 80 per cent. by thus strengthening the lower part. When it is considered that the above molds were all of oblong section, and that such molds are used up much more quickly than square ones, the results must be considered very favorable.

The results of quenching in water are shown by the following table:

Mold. Class No.	Weight. Pounds.	Not quenched. Number of molds broken up.	Average number of heats.	Quenched. Number of molds broken up.	Average number of heats.	Highest number of heats.
42	3,660	116	45.7	153	87.5	126
44	4,012	170	45.8	153	91.4	131
46	4,630	34	46.8	52	71.4	98

These molds were of square section, had no band at the lower end and were not thickened. By simply quenching in water the durability was increased in the case of No. 42 molds 92.3 per cent., No. 44 molds 99.5 per cent., and No. 46 molds 52.5 per cent.

Referring to a recently published article on the use of low phosphorus magnetites for making Bessemer iron, it may be remarked that the molds referred to in the above table were made from such material.

Standard Motive Power Company.—We have before referred in these columns to the new plant of the Standard Motive Power Company, to be built at Canal Dover, Ohio, contracts for which were placed some time since with the Pittsburgh Engineering Company, Lewis Block, Pittsburgh. The plans proposed provide for a yearly output of 550 locomotives. Eventually the company will also take up the manufacture of compound condensing locomotives, under the Dodge system. The buildings will consist of an erecting shop, 150 x 500 feet; boiler shop, 80 x 500 feet; foundry, 80 x 300 feet, to have a capacity of 150 tons per day of gray iron and semisteel castings; a blacksmith shop, 80 x 300 feet; power house, 82 x 129, and several small buildings. The buildings will be constructed of brick with concrete foundations and slate roofs. There will be seven electric traveling cranes; one 100-ton, double trolley; one 35-ton, two 115-ton, one 10-ton and two 5-ton riveting cranes. Individual motors, from ½ to 150 horse-power, will be used to drive the machinery. The power plant will contain 1150 horse-power, consisting of two 500 and one 150 horse-power engines, four 300 horse-power boilers, one 100 and two 300 kw. generators to be direct connected to the engines; also pumps, feed water heaters, stokers, coal and ashes handling machinery, air compressors, &c. A water works will also be built to have a capacity of 2,000,000 gallons daily. The works, when completed, will be managed by W. B. Watkins, who was for a number of years master mechanic and constructing engineer with the L. S. & M. S., and other railroads. The Standard Motive Power Company were incorporated in September, 1902, with $10,000,000 capital stock, and will expend about $1,000,000 in the construction and equipping of their plant.

The Buffington Cement Plant.

The Illinois Steel Company have purchased 33 acres of land in Lake County, Ind., about 2000 feet east of Indiana Harbor and directly west of Clark Junction, between the Lake Shore & Michigan Southern, and the Chicago, Lake Shore & Eastern railways. The consideration is $50,000 cash. The ground was purchased as a site for the cement factory, which will be constructed to have a capacity of 4000 barrels daily. The new works will be known as the Buffington plant, in honor of President E. J. Buffington of the Illinois Steel Company.

The plant will cost $1,500,000 to build, and will be composed of a building for raw material, 130 x 180 feet; a burner building, 120 x 240 feet; a finishing mill, 70 x 240 feet, and two storage warehouses, each 120 x 350 feet, having a capacity for 400,000 barrels. A machine shop and other structures for repairs will also probably be erected. All buildings will be of cement and steel construction, and it is expected to have the plant in operation by April 1, 1904. Between 400 and 500 men will be given employment. The works will probably be in continuous operation day, night and Sundays as well as other days.

The manufacture of cement was begun by the Illinois Steel Company in 1900, the present plant having a capacity of 2000 barrels a day. The active, urgent and growing demand for cement assures the company of a ready market for all and even more than they can produce now. Provision also has been made by which the capacity of the plant may be doubled, it being contemplated to expend an additional $1,500,000 at some future time.

The Illinois Steel Company have a contract with the United States Government to furnish 65,000 barrels of cement for use in the improvement of the harbor at Duluth. The company will also supply the cement used in the construction of the Standard Office Building and for the corner section of the First National Bank Building, Chicago. The cement used in the construction of the National Life Insurance Building and the Schlesinger & Mayer Building also came from South Chicago, and large quantities have recently been supplied to a number of railroads, including the St. Paul, Illinois Central, Baltimore & Ohio, Wabash, Wisconsin Central, Alton, Great Northern, Chicago Great Western, Eastern Illinois and the Northern Pacific.

The Lukens Iron & Steel Company in the South.

The New Orleans branch of the Lukens Iron & Steel Company has won a prominent position in Southern trade under the efficient management of James W. Porch, who established it only five years ago. He secured modest quarters in a building on South Peters street, and shortly afterward found it necessary to expand. He purchased adjoining buildings until now he occupies a considerable part of the block. The buildings are substantial three-story brick structures, which have been refitted to meet the requirements of the business. The stock carried consists of plates, tubes, rivets and other supplies for boiler and tank makers, as well as sheets, bars, &c. The plate warehouses are equipped with overhead tracks and electric elevators serve the upper floors. A special stock room has just been fitted up for merchant bars. The joists of the second floor have been removed, enabling the bars to stand on end in racks, thus greatly systematizing the work of handling them. The company also own two blocks of ground along the Illinois Central tracks, which they use as a structural yard, in which

they carry a large stock of Jones & Laughlin beams, channels, angles, &c. The yard is fitted with cold saws for cutting to length, and is served by a traveling crane, which can handle pieces from yard to car. The stock of steel carried in the warehouses and yard is stated to be the largest in the South.

The Attitude of Employers Toward Labor Unions.*

We hear and read a great deal about the right of labor to organize; that capital is organized, and why should not labor do likewise and thus protect itself against the encroachment of organized capital. But why so much should be said and written about the right of labor to organize is something incomprehensible, in view of the fact that such right has never been denied, at least not to any great extent. It might well be assumed, then, that the labor leaders who say so much about the right of labor to organize understand full well that the main object of labor unions being to create monopoly of labor and thereby to advance wages and increase the cost of its commodities, they are strictly within our anti-trust laws, both State and national. Not only do they understand this, but they adopt the same methods to escape responsibility under such laws as they use to enforce their demands upon employers. If these laws are valid they should be operative against all classes of citizens alike; if invalid they should be repealed, and it may well be predicted that one of the results of the present rapid growth of associations of employers will be the testing of this question. At the present time there are few, if any, States which are free from statutes prohibiting the combining together of two or more competitors in business for the purpose of fixing or in any manner regulating or controlling prices on commodities of any kind, and, as labor unions do just that very thing, they should be made to answer under the laws for all violations thereof, or the laws should be repealed and all men given equal rights and privileges.

Employers must face the fact that organized labor has about 50 years the start of them. As a matter of fact, associations of employers are of but recent growth in this country, and they have been forced into existence by the arbitrary and dictatorial attitude of the labor unions; moreover, they would not and could not exist were it not for the conditions imposed upon employers by labor unions, which make such organizations imperative as a matter of protection against unlawful interference by the unions.

Public sentiment has always leaned toward the working classes, and in so far as legitimate effort to improve their condition, whether through combination or otherwise, is concerned, it is right that it should be so; but public sentiment has gone further than this and has in many instances extended its sympathy contrary to the best interests of those with whom it sympathized, thereby creating responsibility for much of the spirit of anarchy which reigns during labor strikes. Public sentiment is a great factor in human events, but like the individual, it is liable to err, and it often has erred in cases of labor disputes. Its errors are largely responsible for the fact that this country now stands face to face with the proposition, shall lawlessness and anarchy, under the sanction and control of organized labor, or Americanism, prevail and direct its future destiny?

Labor leaders will, here and there, mildly disapprove of violence, as did the president of the United Mine Workers in his speech before their recent convention at Indianapolis, when he advised against it, on the ground that it is not approved by public sentiment and it therefore injured rather than helped their cause, and then, in almost the same breath, declared himself in favor of the Anti-injunction bill, and appointed a committee to go to Washington and demand its passage. Can any man of ordinary intelligence comprehend by what mode of reasoning he can be sincere in both of these propositions? The president of the American Federation of Labor said, among other similar utterances in connection with the St. Louis street railway strike, "he intended making it a fight to the finish if it took five years to do it; that he would bring all the power of the American Federation of Labor, with its 2,000,000 of members, to bear on the St. Louis Transit Company; that the boycott to be placed on that company would embrace every person, every business man, every association and every corporation and individual who favored them in any way."

We all know that recognition of the union means but little else than absolute surrender of all that is guaranteed to us by the Constitution and the Bill of Rights. Not only is this true from the standpoint of the employer, but it is also true with relation to the wage earner, who, upon becoming a member of a labor union, surrenders his individual liberty and is coerced into slavery more damnable than was the black man of the South, in whose behalf the Civil War was fought. The Revolutionary War was fought by our forefathers that we might enjoy the rights which, as free men and citizens, organized labor, through its tyrannical leaders and walking delegates, says we shall not enjoy. It cannot be denied that the ruling spirit of organized labor is antagonistic to all forms of government other than its own; that its methods and unwritten laws are at war with every principle of peace and justice.

Let us admit that under proper management and through just methods organized labor might in many weys be beneficial to the wage earner, and this, too, without necessarily inflicting injuries upon the employer or the employee, or without enslaving and robbing the latter of his freedom to make the most of the opportunities which may chance to fall in his way, as does the leveling up process of organized labor.

It is not to be assumed, however, that it is within the range of probabilities that labor unions will, in our time at least, be governed generally by any such conservative policy, because their members must necessarily include men of all classes and temperaments, among whom are the radicals, the swashbucklers, the socialists and the anarchists, who are certain to come to the front. It is this class of men who are the leaders and controlling valves of organized labor to-day, have been in the past, and will be in the future. They are men to whom if you give an inch they will demand an ell, and having demanded the ell, will advocate and indorse any sort of lawlessness to enforce the demand.

The history of labor unionism proves clearly that when its leaders become cognizant of the fact that they have power, they also become brazen and devoid of reason in its use.

The power assumed by the officers, organizers and walking delegates of labor unions in endeavoring to control the business of the country cannot and does not meet with the approval of the large number of our intelligent mechanics, who are coerced into their membership, and as organized labor has held the fort for more than a quarter of a century, it is now high time for the employers to capture it, and, assisted by the better element of the workingmen of the country, who are coming to their assistance, they can easily do it.

It rests with the employers to say how long boycotting and other unlawful methods of intimidation will be permitted. If we desire to protect ourselves against these abuses we must have that one purpose in view, and having once started in opposition, we must not falter or turn backward. No expense should be spared in the matter of protecting ourselves in our right to do business in our own way.

When labor organizations are permitted to carry out their purpose to ruin the business of one who will not submit to their demands, then personal liberty will become a farce, personal rights be trampled upon, might, not right, will prevail, and we shall have reached a state of anarchy.

The workingmen of this country, by following the precepts of their irrational leaders, are uprooting the foundation of a great and glorious nation; they are destroying their opportunities and making of their own future a desolate waste.

An organization which makes perjurers of its constituents and sets the pledge of its order above the oath of the courts is a dangerous institution and should not be permitted to exist in any civilized community. Its con-

* Extracts from an address by John Kirby, Jr., of Dayton, Ohio, before the National Association of Manufacturers, New Orleans, La., April 16, 1903.

tinuance can end only in disaster and confusion. It is, therefore, the sublime duty of every true and loyal workingman and citizen to uphold the arm of the law and to aid in its enforcement; to stand manfully by those principles which should always be our irrevocable guide post, and to see that he does his full duty toward the utter annihilation of any and all attempts on the part of any man or set of men to undermine and destroy our Government or to deprive by any means any citizen of the rights and privileges guaranteed under the Constitution of the United States, as these men are and have been doing for years past.

If this Government is to stand, it must protect its every citizen in his "inalienable rights," at home as well as abroad. Its laws must be for all alike, and all must stand equal before the law, for if the rights of the common people are to be overturned by violence and mobs, then it cannot stand. If we are to save to this country the industrial supremacy it has gained among the nations of the world, we must wrest and keep from organized labor the management of our industrial establishments, for it has been weighed in the balance and found wanting.

But what are we going to do about it? That is the question which most concerns us all. Do we have to submit to its dictation? Must we bow our heads and hold up our hands in recognition of its dignity and might? Must we surrender our citizenship on the order of the business agent or walking delegate of a labor union and conduct our business only in such manner as he may choose to dictate? Would we, as a nation, tolerate such imposition from any other country? No, we would not! We would sacrifice our lives and the lives of our sons, our time and our money in destroying or attempting to destroy an enemy who would dare inflict upon us as a nation the wrongs and oppressions which organized labor everywhere is daily heaping upon us as individual citizens of the United States. Where, then, is the remedy? For remedy must come from some source. My conclusions are that the only remedy will be found in thorough organization of employers, whose cardinal principles shall be to protect and encourage the wage earner in the exercise of his right to sell his labor to whom he pleases and at what price he pleases, and to protect the industrious workman in his right to take advantage of the opportunities which fall in his way, and which right he must needs surrender the moment he is enrolled as a member of a labor union, as he is so often compelled to do in order to "hold his job" and earn a living for himself and family, because his employer, through intimidation and fear or erroneous ideas of philanthropy, has recognized the union, and he must have a card or seek employment elsewhere. But where shall he find employment when unionism reigns?

Organize capital as strongly as labor is organized, and the question as to whether employer or employee shall dictate the management will settle itself in short order. I do not want to be misunderstood, however, with reference to my position on the question of organization of employers, for I do not advocate such organization for the purpose of oppression, or for the purpose of taking from the wage earner one iota of his right and privilege to ascend every round of the ladder of life, according to his talents, ambition and opportunities. But let employers form associations, both local and national, for the purpose (1) of aiding, encouraging and protecting the man who is disposed to be free and independent in the disposal of his labor; and (2) with the avowed determination to treat with organized labor in no other manner than by having nothing whatever to do with it, and you will soon put a quietus on that class of men who are ever ready and willing to tear down those things which by perseverance and toil the industrious have built up. You will relegate to the bench and the forge the labor leaders, who are in the business for the salaries, perquisites and notoriety there is in it.

The employer has slept too long; he is too often neglectful of what is going on; he has been and is now altogether too selfish, too narrow, and too thoughtless of his own interest; he looks upon the other fellow's troubles as none of his, and with the hope that he will escape. The fact is, gentlemen, the time is here when every employer of labor in every line of industry should consider this question as an important factor in his business and should contribute liberally of his time and means toward the suppression of this curse in the disguise of ameliorating the poor downtrodden workingman, but which in reality is nothing more or less than an institution through which a class of men thrive without honest work.

The great majority of wage earners are neither anarchists nor socialists; they are not willful law breakers nor lovers or advocates of mob rule and disorder; they want peace and true freedom; they want to live in a country where justice will prevail; they want their children to have the protection of just and equitable laws. It is but a small minority and a few reckless and indifferent leaders who seek good jobs that advocate lawlessness and who terrorize whole communities, for it should be remembered that of the wage earners of this country there is but one in every 14 who is a member of a labor union, and it is fair to assume that 75 per cent. of these are there through coercion and not from choice, and the 25 per cent. not only rules the 75 per cent., but seeks to browbeat and control the multitudes, employers included, and which says our boys shall not be permitted to learn trades and thereby make of themselves useful citizens, but shall become tramps and nuisances to society. It is a clear case of the "tail wagging the dog."

Whatever organized labor may be in theory, its resultant product is socialism, pure and simple. There are no more dangerous—in fact, there are no such dangerous—anarchists in our midst as these leaders of organized labor, who institute strikes, and then aid and abet the thugs and bums who perpetrate the murderous assaults upon men who see fit to work where the strike is on. Did any of you ever know of any such leader resigning his office on account of the outrages perpetrated by strikers under his leadership, or did you ever hear of a member of a labor union being expelled for using violence against a free man? The history of labor unions shows that they repudiate the brotherhood of man and substitute tyranny therefor; that they defy law and government to the full extent of their power to do so; that they recognize no sense of honor or moral obligations, and that they recklessly and maliciously destroy life and property, and keep everybody and everything in a state of chaos. It puts a premium upon indolence and a barrier against energy. It is entirely heedless of the well being and rights of others, and it terrorizes capital and drives it from industrial pursuits.

We need local organizations in every community, embracing every employer of labor in whatever capacity, founded upon broad lines. And the cardinal principles of these organizations should be to protect their members in their rights to manage their businesses in such lawful manner as they may deem proper; the adoption of a uniform legitimate system whereby members may ascertain who is and who is not worthy of their employment; to endeavor to make it possible for any person to obtain employment without being obliged to join a labor organization, and to encourage all such persons in their efforts to resist the compulsory methods of organized labor; to protect their members in such manner as may be deemed expedient and proper against legislative and political encroachments; to unite in bonds of common interest all employers of labor; to uphold and assist the free American workman in maintaining his rights as such, and the adoption of thorough and systematic measures whereby the masses may become better educated on lines of true Americanism, through the dissemination of literature tending to counteract the evil influence of much of the vile reading matter which is so freely circulated by the socialistic and anarchistic element of organized labor.

The rules and regulations of these associations should not be arbitrary; they should be such as will not compel members to handle the labor question upon any fixed lines, but which will leave them free to handle it in such manner as circumstances may warrant, otherwise a barrier will be raised against the numerical strength of membership.

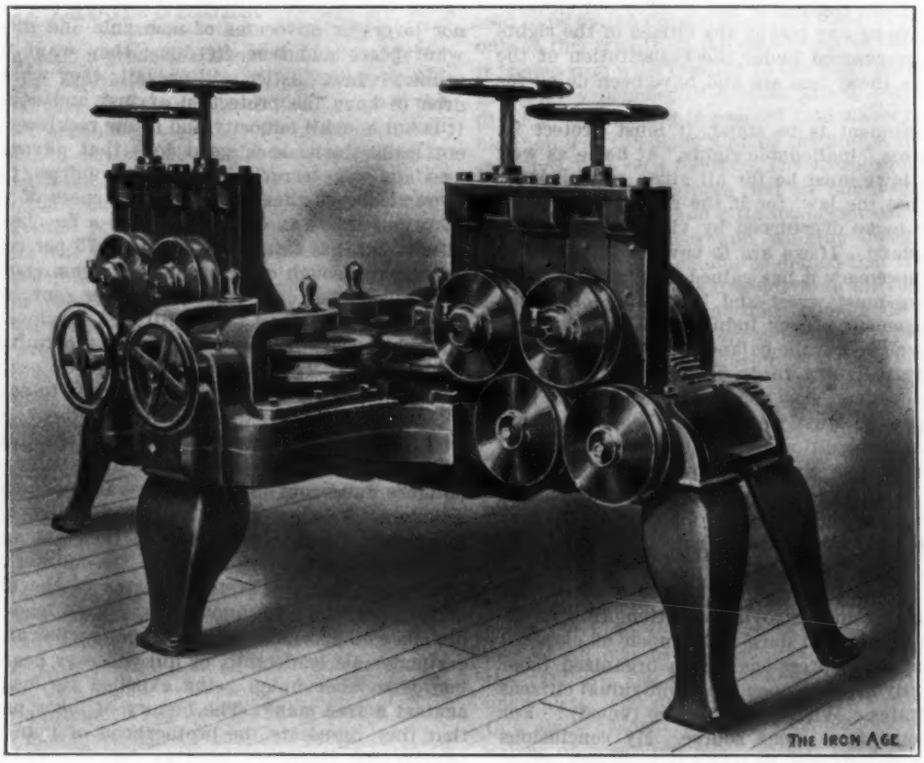
Such organizations have already been formed in many localities, and wherever they exist public sentiment has been molded by their moral influences. The newspapers have taken up their cause; the frugal workmen have taken courage, and industrial peace has taken the place of

industrial war. Then, too, there should be affiliated with these general organizations associations representing the various trades, and these organizations should all be federated into State organizations, with one national association of employers, which shall be a father to all of them. Rest assured that the only remedy for the evils of which we complain lies in the general organization of manufacturers and employers, and the perfecting of a machine with which to do the work; the exercise of wise judgment and skillful manipulation, as well as patient, self sacrificing and determined men at the helm to watch the compass and pilot us safely into port.

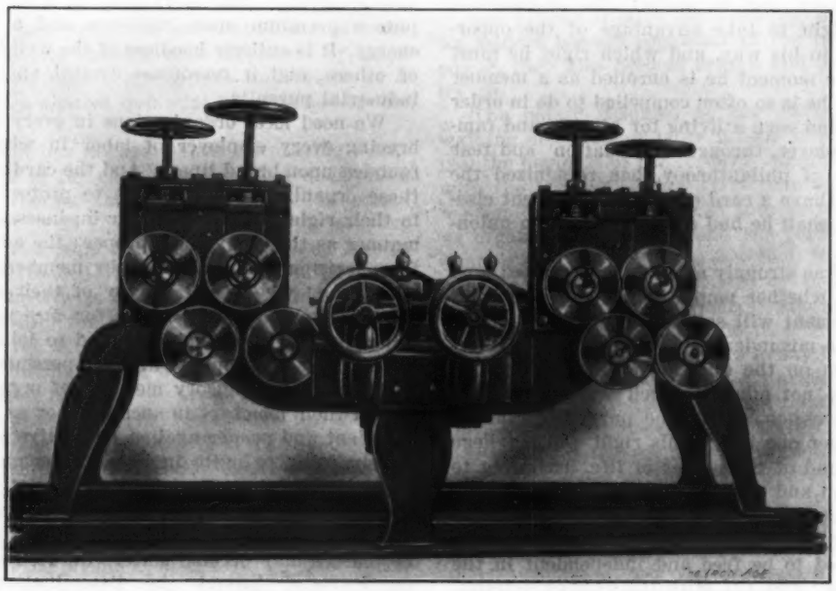
The power which we have in our own hands is sufficient. The question is, will we all do our part, or will some shirk their duty in the cowardly hope of having their chestnuts pulled out of the fire by the other fellow?

The Kane & Roach Tube and Shaft Straightener.

The four half-tones here presented show the new tube and shaft straightener built by Kane & Roach of Syracuse, N. Y. This machine is built in different sizes so as to take the full range of stock from the lightest to the heaviest. It is intended for handling all material cold. There are two pairs of horizontal rolls and four pairs of vertical, so that the stock is operated upon from all directions. This feature, in combination with the unusual length of the machine, insures accurate work. The horizontal rolls are adjustable by screws operated by hand wheels located in front, the vertical rolls being adjusted by hand wheels placed on top of the machine. As the rolls are all outside they can be quickly and easily changed from one size to another. The machine is pow-



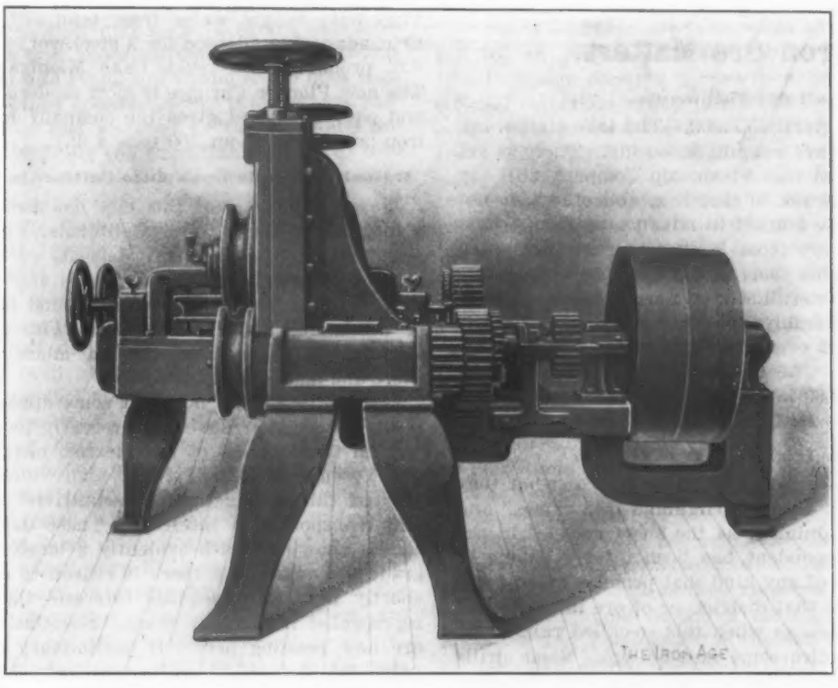
Front Quarter View.



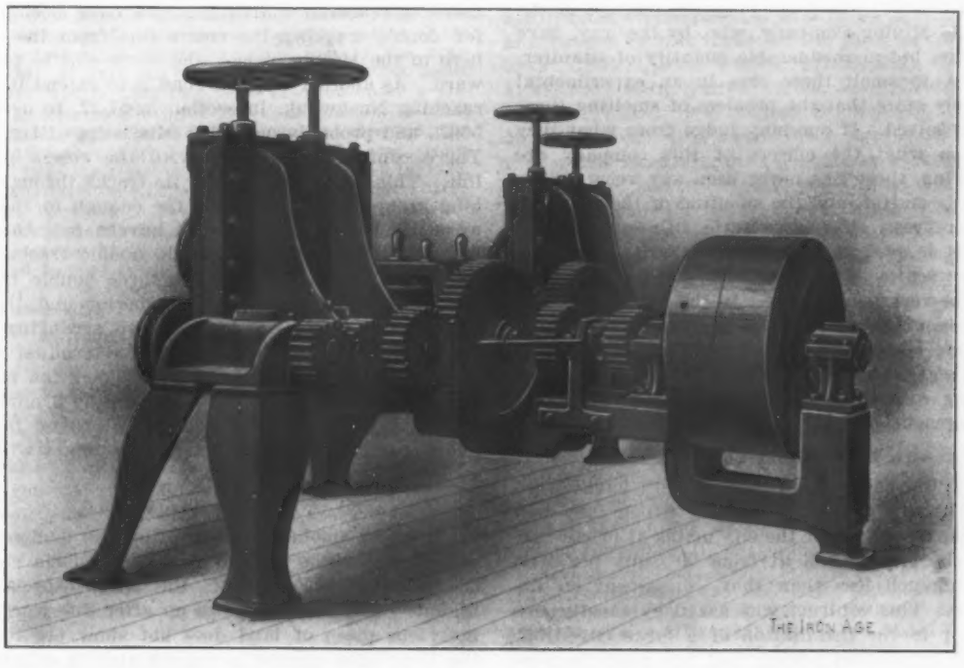
Front View.

THE KANE & ROACH TUBE AND SHAFT STRAIGHTENER.

erfully geared and arranged for two changes of speed. By shifting the clutch lever shown in the end and rear views the machine is started or stopped and made to run either fast or slow, for light or heavy work. The shafts are all forged steel, and the bearings of bronze. The drive is either by belt or direct connected motor or engine.



End View.



Rear View.

THE KANE & ROACH TUBE AND SHAFT STRAIGHTENER.

The Niagara Research Laboratories Company.—The Niagara Research Laboratories Company, Niagara Falls, N. Y., have been incorporated with $100,000 capital. The objects of the company are to do analytical and experimental work for the public, and to act as consulting engineers and experts in perfecting or improving existing processes. They will erect a building in which space and power will be rented, and the use of the laboratories will be allowed for physical, chemical and electro chemical investigations, while they will also manufacture and sell chemicals and allied products, apparatus and supplies. In other words, the new company will nurse electro chemical and electro metallurgical projects of others who may not have the money to extend their research, and in addition the company will work hard on ideas of their own. The president of the company is Edgar B. Stevens of Buffalo, and the vice-president is William B. Rankine. Mr. Stevens is the secretary-treasurer and chemist of the Wood Products Company, and is the inventor of the apparatus that has been in use by that company and their predecessors for many years. The directors of the company for the first year are J. G. White of the firm of J. G. White & Co., New York; William B. Rankine, vice-president of the Niagara Falls Power Com-

pany; W. S. Gray of New York; Norman M. Pierce of Binghamton; Henry J. Pierce, E. B. Stevens, W. G. Case and Dr. Elmer Starr of Buffalo. F. M. Becket, L. E. Saunders and R. A. Witherspoon are the electro chemical engineers of the company, and all of them have been active in the field.

Lake Iron Ore Matters.

Small Ore Shipments.

DULUTH, MINN., April 20, 1903.—The lake strikes are all over and vessels are running smoothly. There is yet no rate, for the Pittsburgh Steamship Company still say they have nothing to ask in that line, and others do not care to come into the market in advance of them. Last April shipments of ore from Minnesota ports amounted to a few thousand tons short of 1,000,000, and shipments from all upper ports were 1,855,000 tons. This April shipments will be considerably smaller from all ports. It is somewhat doubtful if even May equals the corresponding period a year ago. The Gilchrist Transportation fleet, which now numbers 69 large ships, steam and sail, is not yet out and is not even fully outfitted.

The New Highland Iron Range.

There is a great deal in local papers as to what they are pleased to term "the new Highland iron range," and many men are examining it as the snow goes off in the woods. Your correspondent has been utterly unable to find any indications of any kind that promise an iron ore bearing formation in that district, or of ore in place, and is of the same opinion as when this so-called range first come into public notice some months ago. Some drills are going in at various points, and they may get deep enough to show what is there after a while, but as nearly as I can size up the situation practical iron men are not spending their money in the district. Local papers also have much to say about the proposed attempt of the Johnson Nickel Mining Company, who, by the way, have no nickel mines, but a considerable quantity of titaniferous magnetite, to smelt these ores in an experimental way, and freely state that the problem of smelting these ores has been solved. If one may judge from what they say, and from what the officers of this company are quoted as saying, there has never been any very serious problem in this matter, and the smelting of these ores is in constant progress, on a large scale, in other parts of the world. It is even said, and on authority, that furnaces for the treatment of these ores will be erected at this city in the very near future. In the meantime there is considerable excitement among pine land estimators and real estate speculators over lands in the magnetite belts in Lake and Cook counties, east of the Mesaba range, but no mining companies appear to be much interested in this development, or to be watching it very closely.

The Zenith By-Product Coking Plant.

The Zenith Furnace Company of Duluth have closed a contract with the city of Duluth by which they will furnish the supply of gas for the city mains at prices that will permit the city to sell at from 90 cents per 1000 feet down to much less than that, consequent on the amount taken. This contract was asked by the furnace company prior to the installation of a large Otto-Hoffman plant for by-product coking, and this plant is to be installed immediately, in order that it may be running by the beginning of 1904. It is generally understood that the Zenith Furnace Company do not intend to cease their activities or expansions with the one furnace now in operation, or with the construction of a coking plant of the size now planned. Stockholders in the company are heavily interested in coking coal lands in the Eastern fields, and the company themselves own ore lands and a mine or two on the Mesaba range.

The New Pioneer Furnace.

The fine new Pioneer charcoal furnace of the Cleveland Cliffs Iron Company, built during the past two years at North Marquette, Mich., is now blowing for the first time, and is working very satisfactorily. The furnace is of 150 tons capacity, and has ample carbonizing capacity, both in kilns and retorts, with large chemical works for the acid. Their entire investment is about $1,000,000. The company have bought a very large acreage of hard wood lands east and south from Marquette, and have built the Marquette & Southeastern Railway, reaching toward Lake Michigan, both to draw wood to Marquette and for other purposes which will appear in due time. They have bought water front land at Toledo, on Lake Erie, admirably adapted for a steel works, and their road will probably soon reach Lake Michigan at Escanaba. The new Pioneer Furnace is most modern in construction and equipment and gives the company a gross charcoal iron product of about 300 tons a day.

Duluth Interests Look Into California Ore Deposits.

Joseph Sellwood of this city has just returned from a long trip through lower California, where he went in search of reported iron ore deposits of magnitude. He returns disappointed, he says, with the outlook for ore there, the largest deposit he could find being apparently of not more than 1,500,000 tons, with harbors at considerable distance. He covered much territory while there and made a careful study.

Mr. Sellwood did not visit some apparently large deposits of ore that have been recently located by Duluth men in the foothills of the Sierras, near the borders of the Yosemite National Park, and which are being inspected this spring by representatives of large mining and transportation interests. These deposits make excellent showings, with evidently a large tonnage of high grade hematites, and there is reason to expect they will shortly be sold to leading interests that are not now represented in the Far West. Negotiations to that end are now pending here. If preliminary opinions are of value this deposit of ore is very large and good.

Improvements by the Great Northern.

The Great Northern road is preparing for a still greater ore traffic than the 6,000,000 tons it proposes to move this season. Arrangements have been completed for double tracking the entire line from the ore docks here to the Mesaba range, and work will be pushed forward. As another step the road is to extend its line now reaching Nushwauk, in section 32-57-22, to new finds in 56-24, and probably on to the Mississippi River in 55-25. There connection is made with the road's main west line. This road is rebuilding its tracks through the Hibbing group, placing the line far enough to the south to avoid mines, and it will soon have a new through line from the Mississippi to Duluth, double tracked most of the way. There will then be three double track main line railroads between Lake Superior and the Mesaba range. The Great Northern is also arranging for additional dock and yard capacity at lake terminal yards, and for a great transfer yard at Kelly Lake, a few miles south of Hibbing. At the latter point will be 5 miles of yard trackage, with machine shops, great round houses, &c., and ore from many Western Mesaba mines will be made up there for the haul to dock.

Exploration Work.

No small amount of exploration will be done the coming season on the Penokee and Messembria ranges, and on the eastern Vermillion, the latter especially if the famous "section 30" shows up after due work. If that notorious piece of land does not show ore it will give the Vermillion district a setback that it will take years to recover from. Just now four heavy drills are working on the land, with what result is not stated. There is also much work under way in the Steep Rock Lake region, north of the Canadian line, where several heavy concerns are drilling and test pitting. D. E. W.

The extensive plans of the Lackawanna Steel Company were the occasion of an inspection of the new plant at Stony Point, Buffalo, by a special party of financiers and railroad men on the 17th inst. The party comprised Moses Taylor, H. McK. Twombly, W. D. Sloan, J. A. Barden, H. A. C. Taylor, P. R. Pyne, A. N. Morris, R. D. Winthrop, C. L. Blair and A. D. Russell, stockholders, President W. H. Newman of the New York Central Railroad, and President W. H. Truesdale of the Delaware, Lackawanna & Western Railroad.

Canadian Relations with the United States.

WASHINGTON, D. C., April 21, 1903.—The annual report of United States Consul-General Bittinger of Montreal, Canada, which will appear in the forthcoming "Commercial Relations of the United States" for 1902, contains some significant statements with regard to the efforts being made by Canadian manufacturers, and especially producers of iron and steel who are now enjoying a bounty, to obtain additional aid in the shape of a high protective tariff. These statements are interestingly supplemented by figures just received by the Treasury Bureau of Statistics, showing the Canadian imports of iron and steel products, from which it appears that, in spite of the preferential tariff enjoyed by British goods, the manufacturers of the United States continue to hold a long lead over their British rivals.

Mr. Bittinger says that the tariff question is as important in Canada to-day as it ever was in the United States and that manufacturers want, if possible, a prohibitive tariff against the United States especially. The Dominion Cabinet is divided on the question and no one can foretell the outcome, although the indication is that a majority of the party in power will not accede to the extreme demands of the high protectionists. In support of the proposition to maintain the present tariff, the Government organs point to the trade figures for the last fiscal year as compared with those of 1896, when the present Government came into office, and assert that this comparison "will afford very little satisfaction to those manufacturers who are clamoring for an increase in the tariff." In this connection the following figures are quoted:

The increase in the aggregate trade of Canada on the basis of goods entered for consumption and Canadian produce exported (that is, excluding foreign goods) for the six years was $168,000,000 in round figures. The total imports show an increase in the six years of about $94,000,000, and the total exports of about $90,000,000, making a total increase in the six years of about $184,000,000 in the aggregate trade. This is the result of a revenue tariff, while during the whole period of the national policy, so called, the trade of the country was practically stagnant. In 1873 the imports were $128,000,000 under a revenue tariff, and in 1895 they were $110,000 under a protective tariff, a decrease of $18,000,000. Take trade with Great Britain: In 1873 goods entered for consumption were $68,000,000, and in 1896 they were reduced over 50 per cent., being $32,000,000. Take the trade with the United States: In 1873, under a revenue tariff, the imports for consumption were $47,000,000, which increased to $54,000,000 in the following year. In 1895 they were exactly $54,000,000, so that in over 20 years under high protection there was no increase, but, on the contrary, they had dropped as low as $29,000,000. The trade with France is nearly four times what it was in 1896, and it has doubled with Germany.

Bounties on Iron and Steel.

Referring to the iron and steel trade of the Dominion Mr. Bittinger says: "Like all the other manufacturers, the iron and steel men, who are at present getting a high bounty, are clamoring for more aid in the shape of a protective tariff. The encouragement granted the manufacture of iron and steel in Canada is partly in the form of bounty and partly customs duties." The bounties are given as shown below:

Period.	On pig iron.—From native ore.	On pig iron.—From foreign ore.	On steel.
To April 21, 1902	$3.00	$2.00	$3.00
April 21, 1902 to July 1, 1903	2.70	1.80	2.70
July 1, 1903, to July 1, 1904	2.25	1.50	2.25
July 1, 1904, to July 1, 1905	1.65	1.10	1.65
July 1, 1905, to July 1, 1906	1.05	.70	1.05
July 1, 1906, to July 1, 1907	.60	.40	.60

The amount which has been paid in bounty on pig iron in Canada during each fiscal year since 1884 is as follows:

1884	$44,090	1893	$93,896
1885	38,655	1894	125,044
1886	39,270	1895	63,384
1887	59,576	1896	104,105
1888	33,313	1897	66,509
1889	37,234	1898	165,654
1890	25,697	1899	187,954
1891	20,153	1900	238,307
1892	30,294	1901	351,259

The sum for 1901 was thus far in excess of that of any previous year. These bounties were apportioned to the following:

Canadian Iron Furnace Company, Three Rivers	$16,614
Midland Iron Works	59,169
Deseronto Iron Company	27,468
Dominion Iron & Steel Company, Sydney	55,287
Electric Reduction Company	1,173
Hamilton Iron & Steel Company	12,455
John McDougall & Co	2,379
Nova Scotia Steel & Iron Company	66,711

"There was paid out in bounties on iron puddled bars $16,703, an increase of $6581. The Hamilton Steel & Iron Company received the whole amount. The bounties on steel ingots amounted to $100,057, or $35,697 in excess of the year previous. Of this sum the Hamilton Steel & Iron Company received $28,310 and the Nova Scotia Steel Company $71,746.

"Canada consumes annually about 800,000 tons of iron and the products thereof, and only about 30 per cent. is produced by native furnaces. According to recently completed official reports of the production of pig iron in the Dominion during the first six months of 1902, there was a slight increase compared with the last half of 1901, but a very great decrease compared with the first six months of that year. In the first half of 1902 there were produced in the Dominion 157,804 tons of pig iron, as compared with 149,152 tons in the last half of 1901 and 95,024 tons in the first half. In the first half of 1902 there was an increase of 7852 tons over the last half of 1901, or more than 5 per cent.; compared with the production of the first six months of 1901 the increase is 62,780 tons, or 66 per cent. At the end of last June there were 14 blast furnaces in the Dominion."

Canadian Imports.

The semiannual report of the Canadian Department of Trade and Commerce for the six months ending December, 1902, contains some very interesting figures with regard to imports of iron and steel and manufactures thereof. The total imports under these schedules for the closing six months of the past three calendar years were as follows: 1900, $13,271,023; 1901, $15,182,415; 1902, $19,974,555. The relative shares of the United States and Britain in this trade for the three years were as follows: 1900, United States, $11,107,283; Great Britain, $1,875,886; 1901, United States, $11,037,791; Great Britain, $3,277,378; 1902, United States, $13,691,888; Great Britain, $4,689,771. From these figures it will be seen that while Great Britain has made a large percentage gain in the past two years, the United States still continues to dominate the trade, the value of its exports of iron and steel in 1902 amounting to three times those of Great Britain. The detailed figures showing the imports of iron and steel and manufactures thereof disclose the fact that in such important classes as builders' hardware, machinery and steel rails Great Britain has lost rather than gained trade during the past year. The most important gains of British producers have been in pig and scrap iron, of which the imports from Great Britain have increased more than tenfold, and in unenumerated miscellaneous manufactures, which have nearly doubled. Following are the details of the general classifications showing the total imports and the shares of Great Britain and the United States for the two half-yearly periods ending December 31, 1901 and 1902:

Agricultural implements, 1901, $993,815—Great Britain $6154, United States $987,538; 1902, $1,229,986—Great Britain $7366, United States $1,222,336. Builders' hardware, 1901, $290,265—Great Britain $29,584, United States $259,337; 1902, $324,218—Great Britain $26,619, United States $295,993. Iron in pigs, kentledge and scrap, 1901, $233,235—Great Britain $29,885, United States $201,591; 1902, $758,287—Great Britain $316,691, United States $439,875. Iron and steel sheets, plates, &c., 1901, $979,216—Great Britain $805,395, United States $170,007; 1902, $1,197,933—Great Britain $998,139, United States $193,082. Machinery and machines, 1901, $2,868,953—Great Britain $153,608, United States $2,681,630; 1902, $3,654,220—Great Britain $136,961, United States $3,486,698. Steel rails, 1901, $1,717,480—Great Britain $807,727, United States $892,829; 1902, $2,173,474—Great Britain $704,901, United States $1,142,140. Tools and implements, 1901, $402,878—Great Britain $27,036, United States $363,233; 1902, $482,211—Great Britain $29,784, United States $429,310. Tubing, 1901, $404,681—Great Britain $96,552, United States $289,764; 1902, $543,557—Great Britain $145,557, United States $359,403. All other iron and steel manufactures, 1901, $7,291,892—Great Britain $1,331,437, United States $5,191,858; 1902, $9,610,649—Great Britain $2,220,763, United States $6,123,054.

W. L. C.

Developments in the German Iron Trade.

BERLIN, April 4, 1903.—Three distinct factors have recently brought about a consolidation of the six great German steel and iron syndicates into one large advisory and co-operative combine, viz.: 1, The urgent demand for the extension and protection of foreign trade to provide a steady outlet for the increasing surplus production; 2, the competition of the United States Steel Corporation; and 3, the desire for the regulation of prices, labor disputes and kindred issues at home. The newly launched "Deutsche Stahlwerk Verband" is to Germany what the United States Steel Corporation is to the United States. The leading spirits of the gigantic combine are men of broad views and a strong personality, and were appointed because of their organizing and executive resources. The combine resembles in many respects the big steel corporation in the United States, but with the essential difference that its mandates are enforced only as the result of mutual agreement.

In Germany the most energetic leaders of trade and industries are impelled by the desire to reduce every branch of business to the finest point of mathematical calculation. Within the last six years the "cartel" system has been elaborated and made well nigh impregnable. Periodically members of these associations, and especially in the various steel and iron cartels, threaten to withdraw and invalidate them. But the newly organized Verband proves that the German "Industrieller" and exporter clings to his cartel system, and knows that the quicker the German combines are fashioned after the American prototype the more successful Germany will be in meeting the competition abroad. The new "Deutsche Stahlwerk Verband" embraces the pig iron cartel with its three subsidiary syndicates with headquarters at Düsseldorf: the Ingot and Steel Billet Syndicate; the Beam Syndicate, embracing the South German Works; the Lower Rhine and Westphalia Works and the Peine Company of Hanover; the Drawn Wire Syndicate with headquarters at Hamm, in Westphalia, and finally the Wire Rod Syndicate centered at Hagen, Westphalia.

It is not difficult to see that this "Verband" will exert a world wide influence, and make itself a factor in the markets of the United States also. For the steel and iron exporting interests of Germany have of late discovered that there are independent manufacturing and consuming concerns willing to pay the additional cost of freight and duty. It is well known here that a large amount of the iron and steel material shipped from this country to the United States is worked into finished products in the mills and factories of the United States and then placed on the export market, so that the importer is able to obtain 99 per cent. of his duty payment back under the special provision of the Dingley law allowing this deduction for imported raw material which is finished in the "States" and then reshipped for foreign markets.

Düsseldorf, the headquarters of the leading iron and steel syndicates, and likewise the central depot for the new general alliance, has been the scene of very interesting negotiations of late. Representatives of the United States Steel Corporation, who arrived here from London, attempted recently to negotiate a close working agreement with the ingot and steel billet, the beam and pig iron syndicates in order to control the German export movement of iron and steel material to the United States. These negotiations, however, failed to meet with success. In almost every other German branch of industries, particularly in the cement, alkali, chemical and other branches of export trade, there have been combinations of late with American interests. American capitalists have also insured for themselves a strong hold on German cement and alkali works of late.

But the German steel and iron syndicates fight shy of such advances when coming from representatives identified with the big corporation. Several days ago the announcement came that the price of pig iron was decreased in the United States in order to meet the German competition and resist the invasion of German exports. These cable announcements are received at Düsseldorf in the same spirit which greeted the decision of the appraiser at Philadelphia and New York to appraise the duty on German imports, steel billets, not upon the basis of the invoice price, but upon the price current in the German market, which is materially in excess of the export price.

Despite the disadvantages of freight payments and the high duty on German iron and steel imports, the German syndicates have been making profits on the recent trade with the United States. Three days prior to the present writing and after the announcement of the price reductions, as cabled from the report of *The Iron Age* to leading financial journals here, the *Börsen Courier* brought information from its Cologne correspondent that a contract had been closed with the Siegerland Spiegel Syndicate for a large quantity of their output to American purchasers at prices which will net handsome profits. At the same time the financial columns show that there is no apparent diminution in the German exports to the other side, and that contracts have also been closed recently for exports from England and Belgium.

The syndicates at Düsseldorf transacting the bulk of the export trade to the United States report that their contracts run up to December 1 for the present year, and that many of the largest mills are occupied in supplying this demand from abroad. To confirm their statements the recent tabular statement of the United States Consul at Düsseldorf shows that exports from that consular district to the United States exceed all previous records for the first three months of the present year, and that the increase is due to the large exports of iron and steel. For the consular district of Cologne there is an excess of exports to the United States for the first quarter due almost entirely to the increase of iron, steel, wire and ingots. The other consular districts from which iron and steel exports to the United States originate likewise reveal large increases.

There is no doubt, therefore, that the exports to the United States and to England are just now the backbone of the German industrial market. This is not only acknowledged in the reports issued by the leading iron corporations, but is reflected in the general upward movement in the quotation of their stocks. It is not difficult to realize, therefore, that every effort is being made to keep open this avenue for the relief of the otherwise congested and drooping markets. The financial reviewers attribute the bulge in iron and steel stock quotations almost entirely to the exports to the United States. They also dwell laboriously on the slump that will surely follow and the bearish influence on the industrial market when these exports cease or in case counter movements are made in the United States by reducing the price of iron.

It is only necessary to quote the stocks of the leading German iron and steel corporations at the beginning of the present year and at the close of business for the first quarter to show how marked has been the effect of the American purchases. The following table will show the comparison:

	January 1, 1903.	March 31, 1903.
Bochumer Steel Works	182	191
Donnersmarckhütte	206	216
Geisweider Iron Works	147	166
Hasper	155	172
Phœnix	127	140
Bismarckhütte	222	233
Hochdahl	147	166
Aplerbecker	91	114

These gains are larger than at any time since the break in the German industrial market in 1901 after the fatal bank crashes.

A leading director in one of the Westphalia iron syndicates, who was in Berlin recently to give testimony before the Commission of the Department of Interior regarding the workings of the cartel, accorded your correspondent an interview, in which he stated: "Responsible agents of the large steel corporation of the United States visited us recently in order to effect a working agreement by virtue of which we should be allowed to continue shipments to the United States, but only through

the agency of the American representatives. We immediately understood that these overtures were intended to dislodge us from the American market. But we met all such requests in a noncommittal manner. Our most profitable exports have been to the Union. The largest exports are pig iron and steel products. The latter include rails, girders and ingots. The demand is for cheaper material and hardly any for finished products. We realize that the demand is not normal, and may cease at any time. Nevertheless, the business has been so profitable that we in common with other interests have advocated the establishment of a central bureau in New York to promote German sales. We must now depend chiefly upon our exports in order to keep our mines and mills in operation. The consumption at home is at low ebb and not increasing, either. The prices are unusually low, even for the United States account. That is evident from the small dividend payments last year. But now there is more solidity in the German iron and steel trade interests. This is not only to promote exports to the United States, but other countries as well."

In general, the German iron and steel market is faring comparatively better just now than at the same period last year. Iron and steel shares are more popular in the Börse and an object of speculation. But there are no evidences of increases in capitalization. The mills are all in operation, but the exceedingly low export prices make this briskness somewhat delusive. C. A. L.

Recent Accidents to Battle Ships.

Modifications of Naval Practice May Result.

WASHINGTON, D. C., April 21, 1903.—The recent accidents to the battle ships "Iowa" and "Maine," and especially the extraordinary mishap suffered by the latter vessel, are causing the naval experts and Department officials much concern, and may result in certain highly important modifications of the present naval practice. The points now under consideration embrace the desirability of certain types of boilers, the necessity for strengthening turret and deck supports as well as gun mounts, the necessity of reducing the present service charges of smokeless powder and the bearing which all these modifications may have upon the relative efficiency of gun and armor plate.

Immediately after the accident to the "Maine," which resulted from the firing of service charges of smokeless powder in target practice, a careful examination was made to determine the cause, and especially to ascertain whether any structural weakness was developed. At the conclusion of this examination, by order of the Secretary of the Navy, Admiral Bowles, the Chief Constructor, gave out the following official statement:

> The officers who have examined the turrets of the "Maine" have found that the damage done consists largely in the loosening up and breaking of fastenings and rivets, and is in no respect due to general structural weakness of the ship. The supports under the roller paths are of the usual construction, being built up of plates and angles. Since the date of the design of the "Maine," however, the use of smokeless powder with higher pressure guns has been adopted, and the recoils allowed have been shortened; both of these improvements, while desirable in themselves, have greatly increased the strains on the supporting structure, which in actual test of firing has proved inadequate.
>
> Were it not for the great weight of the revolving part of the turret, amounting to over 400 tons, the fitting of the additional stiffening in the supports which has been decided to be necessary would not be a very elaborate work, but owing to the inaccessibility of the parts it is anticipated that the repairs will take some little time. The deformations of the decks in the vicinity of certain 6-inch guns, due to the same general cause, are much less important and can be easily remedied. The chief constructor considers no blame can be attached to the contractors for the "Maine," as there was no evidence whatever of defective workmanship.

Effect Upon the Boilers.

While the statement given above makes no reference to the effect of the firing of the "Maine's" guns upon her boilers, yet it is now stated that a special report to the Chief of the Bureau of Steam Engineering prepared by the Chief Engineer of the vessel says that the entire battery suffered severely and that 90 tubes were bent and several actually burst. Chief Constructor Bowles, assisted by an engineer officer, will make a very careful examination of the boilers, for this feature of the mishap is regarded as even more serious than the general breakup under the turrets, gun emplacements and the decks. The "Maine's" boilers are of the Niclausse water tube type, a pattern of boiler but recently adopted in the navy. For a number of years there has been considerable controversy in the Department with regard to the relative efficiency of the two chief types of water tube boilers, and the Niclausse boilers, after very exhaustive tests in the merchant marine, were finally ordered to be placed in the "Maine" and five other war ships recently constructed or now building. The Bureau of Steam Engineering has been regarded as rather disposed to look with disfavor on this boiler, though this apparent prejudice has usually been set down to the unwillingness of the older officers of the service to experiment with new types. Certain experts of the Bureau are disposed to think that the injury suffered by the "Maine's" boilers was due to the method of their installation rather than to any defect in the boilers themselves, and it is further pointed out that it would have been extraordinary had the tubes not been bent under the shock that caused the surprising havoc shown by the official reports to have resulted from the target practice.

The Turret Supports.

One important result of the accident to the "Maine" will be the strengthening of all the turret supports of vessels under construction as well as those of the battle ship "Missouri." Admiral Bowles considers the loosening of the turrents of the "Maine" as much more important than the injury sustained by the emplacements of the 6-inch guns. In explanation of the failure of the turrets to stand the strain, it is stated that the power of the guns has constantly increased while there has been no increase in the strength of the turrets to withstand the strain imposed by the use of larger powder charges and smokeless powder. In this connection it is said that the turret supports of the "Oregon," "Indiana," "Massachusetts," "Kearsarge" and "Kentucky," "Illinois," "Wisconsin" and "Alabama" are adequate to withstand the recoil of the 13-inch guns with which they are armed. The velocity of the "Maine's" 12-inch guns, however, is greater than that of the old 13-inch guns; the powder charge is larger and the recoil correspondingly heavier. To save weight and space the turret supports of the "Maine" were lightened, and this policy was pursued with respect to every other vessel designed at the same time or since. The expense of strengthening the vessels mentioned will approximate $5000 each, with the exception of the "Missouri," as to which the cost will be somewhat greater. The cost of repairs to the "Maine" has not even been roughly estimated by the Chief Constructor, but naval officers who have examined the vessel with some care put the amount at not less than $100,000. The Bureau of Steam Engineering will determine whether the "Maine's" boilers are defective in type or construction, and they may possibly be replaced, in which case the total expense would be much larger than the figure mentioned. While the point has not been finally decided, it is the general opinion that the contractor will not be called upon to bear any part of the expense of the repairs.

Smokeless Powder Not Fully Understood.

The extraordinary effects resulting from the firing of smokeless powder in the high power guns of the "Maine" have resulted in the issuing of instructions by the Chief of the Bureau of Ordnance to cut down the service charges of this kind of powder, and it is probable that a series of experiments will be made in the near future to determine certain qualities of this powder which are not fully understood by the ordnance experts. The downward action of the concussion and recoil, which is characteristic of dynamite, has puzzled the experts and has emphasized the importance of exhaustive tests. It is generally conceded that the action of smokeless powder is not fully understood, and the charges will be lightened until more is known.

The high penetrating power of the latest type of naval rifle employing the service charge of smokeless powder has given the gun the advantage which it now enjoys in the never ending contest between rifle and armor plate.

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But the German steel and iron syndicates fight shy of such advances when coming from representatives identified with the big corporation. Several days ago the announcement came that the price of pig iron was decreased in the United States in order to meet the German competition and resist the invasion of German exports. These cable announcements are received at Düsseldorf in the same spirit which greeted the decision of the appraiser at Philadelphia and New York to appraise the duty on German imports, steel billets, not upon the basis of the invoice price, but upon the price current in the German market, which is materially in excess of the export price.

Despite the disadvantages of freight payments and the high duty on German iron and steel imports, the German syndicates have been making profits on the recent trade with the United States. Three days prior to the present writing and after the announcement of the price reductions, as cabled from the report of *The Iron Age* to leading financial journals here, the *Börsen Courier* brought information from its Cologne correspondent that a contract had been closed with the Siegerland Spiegel Syndicate for a large quantity of their output to American purchasers at prices which will net handsome profits. At the same time the financial columns show that there is no apparent diminution in the German exports to the other side, and that contracts have also been closed recently for exports from England and Belgium.

The syndicates at Düsseldorf transacting the bulk of the export trade to the United States report that their contracts run up to December 1 for the present year, and that many of the largest mills are occupied in supplying this demand from abroad. To confirm their statements the recent tabular statement of the United States Consul at Düsseldorf shows that exports from that consular district to the United States exceed all previous records for the first three months of the present year, and that the increase is due to the large exports of iron and steel. For the consular district of Cologne there is an excess of exports to the United States for the first quarter due almost entirely to the increase of iron, steel, wire and ingots. The other consular districts from which iron and steel exports to the United States originate likewise reveal large increases.

There is no doubt, therefore, that the exports to the United States and to England are just now the backbone of the German industrial market. This is not only acknowledged in the reports issued by the leading iron corporations, but is reflected in the general upward movement in the quotation of their stocks. It is not difficult to realize, therefore, that every effort is being made to keep open this avenue for the relief of the otherwise congested and drooping markets. The financial reviewers attribute the bulge in iron and steel stock quotations almost entirely to the exports to the United States. They also dwell laboriously on the slump that will surely follow and the bearish influence on the industrial market when these exports cease or in case counter movements are made in the United States by reducing the price of iron.

It is only necessary to quote the stocks of the leading German iron and steel corporations at the beginning of the present year and at the close of business for the first quarter to show how marked has been the effect of the American purchases. The following table will show the comparison:

	January 1, 1903.	March 31, 1903.
Bochumer Steel Works	182	191
Donnersmarckhütte	206	216
Geisweider Iron Works	147	166
Hasper	155	172
Phœnix	127	140
Bismarckhütte	222	233
Hochdahl	147	166
Aplerbecker	91	114

These gains are larger than at any time since the break in the German industrial market in 1901 after the fatal bank crashes.

A leading director in one of the Westphalia iron syndicates, who was in Berlin recently to give testimony before the Commission of the Department of Interior regarding the workings of the cartel, accorded your correspondent an interview, in which he stated: "Responsible agents of the large steel corporation of the United States visited us recently in order to effect a working agreement by virtue of which we should be allowed to continue shipments to the United States, but only through

the agency of the American representatives. We immediately understood that these overtures were intended to dislodge us from the American market. But we met all such requests in a noncommittal manner. Our most profitable exports have been to the Union. The largest exports are pig iron and steel products. The latter include rails, girders and ingots. The demand is for cheaper material and hardly any for finished products. We realize that the demand is not normal, and may cease at any time. Nevertheless, the business has been so profitable that we in common with other interests have advocated the establishment of a central bureau in New York to promote German sales. We must now depend chiefly upon our exports in order to keep our mines and mills in operation. The consumption at home is at low ebb and not increasing, either. The prices are unusually low, even for the United States account. That is evident from the small dividend payments last year. But now there is more solidity in the German iron and steel trade interests. This is not only to promote exports to the United States, but other countries as well."

In general, the German iron and steel market is faring comparatively better just now than at the same period last year. Iron and steel shares are more popular in the Börse and an object of speculation. But there are no evidences of increases in capitalization. The mills are all in operation, but the exceedingly low export prices make this briskness somewhat delusive. C. A. L.

Recent Accidents to Battle Ships.

Modifications of Naval Practice May Result.

WASHINGTON, D. C., April 21, 1903.—The recent accidents to the battle ships "Iowa" and "Maine," and especially the extraordinary mishap suffered by the latter vessel, are causing the naval experts and Department officials much concern, and may result in certain highly important modifications of the present naval practice. The points now under consideration embrace the desirability of certain types of boilers, the necessity for strengthening turret and deck supports as well as gun mounts, the necessity of reducing the present service charges of smokeless powder and the bearing which all these modifications may have upon the relative efficiency of gun and armor plate.

Immediately after the accident to the "Maine," which resulted from the firing of service charges of smokeless powder in target practice, a careful examination was made to determine the cause, and especially to ascertain whether any structural weakness was developed. At the conclusion of this examination, by order of the Secretary of the Navy, Admiral Bowles, the Chief Constructor, gave out the following official statement:

The officers who have examined the turrets of the "Maine" have found that the damage done consists largely in the loosening up and breaking of fastenings and rivets, and is in no respect due to general structural weakness of the ship. The supports under the roller paths are of the usual construction, being built up of plates and angles. Since the date of the design of the "Maine," however, the use of smokeless powder with higher pressure guns has been adopted, and the recoils allowed have been shortened; both of these improvements, while desirable in themselves, have greatly increased the strains on the supporting structure, which in actual test of firing has proved inadequate.

Were it not for the great weight of the revolving part of the turret, amounting to over 400 tons, the fitting of the additional stiffening in the supports which has been decided to be necessary would not be a very elaborate work, but owing to the inaccessibility of the parts it is anticipated that the repairs will take some little time. The deformations of the decks in the vicinity of certain 6-inch guns, due to the same general cause, are much less important and can be easily remedied. The chief constructor considers no blame can be attached to the contractors for the "Maine," as there was no evidence whatever of defective workmanship.

Effect Upon the Boilers.

While the statement given above makes no reference to the effect of the firing of the "Maine's" guns upon her boilers, yet it is now stated that a special report to the Chief of the Bureau of Steam Engineering prepared by the Chief Engineer of the vessel says that the entire battery suffered severely and that 90 tubes were bent and several actually burst. Chief Constructor Bowles, assisted by an engineer officer, will make a very careful examination of the boilers, for this feature of the mishap is regarded as even more serious than the general breakup under the turrets, gun emplacements and the decks. The "Maine's" boilers are of the Niclausse water tube type, a pattern of boiler but recently adopted in the navy. For a number of years there has been considerable controversy in the Department with regard to the relative efficiency of the two chief types of water tube boilers, and the Niclausse boilers, after very exhaustive tests in the merchant marine, were finally ordered to be placed in the "Maine" and five other war ships recently constructed or now building. The Bureau of Steam Engineering has been regarded as rather disposed to look with disfavor on this boiler, though this apparent prejudice has usually been set down to the unwillingness of the older officers of the service to experiment with new types. Certain experts of the Bureau are disposed to think that the injury suffered by the "Maine's" boilers was due to the method of their installation rather than to any defect in the boilers themselves, and it is further pointed out that it would have been extraordinary had the tubes not been bent under the shock that caused the surprising havoc shown by the official reports to have resulted from the target practice.

The Turret Supports.

One important result of the accident to the "Maine" will be the strengthening of all the turret supports of vessels under construction as well as those of the battle ship "Missouri." Admiral Bowles considers the loosening of the turrets of the "Maine" as much more important than the injury sustained by the emplacements of the 6-inch guns. In explanation of the failure of the turrets to stand the strain, it is stated that the power of the guns has constantly increased while there has been no increase in the strength of the turrets to withstand the strain imposed by the use of larger powder charges and smokeless powder. In this connection it is said that the turret supports of the "Oregon," "Indiana," "Massachusetts," "Kearsarge" and "Kentucky," "Illinois," "Wisconsin" and "Alabama" are adequate to withstand the recoil of the 13-inch guns with which they are armed. The velocity of the "Maine's" 12-inch guns, however, is greater than that of the old 13-inch guns; the powder charge is larger and the recoil correspondingly heavier. To save weight and space the turret supports of the "Maine" were lightened, and this policy was pursued with respect to every other vessel designed at the same time or since. The expense of strengthening the vessels mentioned will approximate $5000 each, with the exception of the "Missouri," as to which the cost will be somewhat greater. The cost of repairs to the "Maine" has not even been roughly estimated by the Chief Constructor, but naval officers who have examined the vessel with some care put the amount at not less than $100,000. The Bureau of Steam Engineering will determine whether the "Maine's" boilers are defective in type or construction, and they may possibly be replaced, in which case the total expense would be much larger than the figure mentioned. While the point has not been finally decided, it is the general opinion that the contractor will not be called upon to bear any part of the expense of the repairs.

Smokeless Powder Not Fully Understood.

The extraordinary effects resulting from the firing of smokeless powder in the high power guns of the "Maine" have resulted in the issuing of instructions by the Chief of the Bureau of Ordnance to cut down the service charges of this kind of powder, and it is probable that a series of experiments will be made in the near future to determine certain qualities of this powder which are not fully understood by the ordnance experts. The downward action of the concussion and recoil, which is characteristic of dynamite, has puzzled the experts and has emphasized the importance of exhaustive tests. It is generally conceded that the action of smokeless powder is not fully understood, and the charges will be lightened until more is known.

The high penetrating power of the latest type of naval rifle employing the service charge of smokeless powder has given the gun the advantage which it now enjoys in the never ending contest between rifle and armor plate.

If, however, the full efficiency of modern naval ordnance cannot be developed without racking the ships to pieces, the necessity will not be so great for increasing the resisting power of the armor plate. It is probable, however, that after the tests referred to have been made, sufficient structural changes in the turret and deck supports and in the mounts and gun carriages will be made to warrant the use of the full service charge of smokeless powder.

W. L. C.

A Preposterous Prospectus.

The Mohawk Valley Steel & Wire Company.

There is in circulation an extraordinary document entitled "Facts and Figures Regarding the Advantages and Economies of the Mohawk Valley Steel & Wire Company, Demonstrating the Value of Their First Mortgage Bonds as an Investment," which need only be superficially considered by those familiar with the iron industry to establish the capacity of its promoters. The company have a capital stock of $25,000,000, series A 5 per cent. bonds of $6,000,000, and series B 5 per cent. bonds of $10,000,000. The first series is a first mortgage on 226 acres of land in Utica, a proposed plant in that town, which is to include open hearth furnaces and blooming, billet, bar, structural, rod and tie mills and nail and wire factories, four wire plants at Cuyahoga Falls and New Castle, on which the new company have cash options, and 42,000 acres of coal and ore lands in Cullman and Fayette counties, Ala. The series B bonds of $10,000,000 are to cover 1000 acres at Brunswick, Ga., a proposed plant to include five blast furnaces, 16 open hearth furnaces, blooming, billet, bar, rod, cotton tie, sheet, rail and structural mills and ship building plant; 50,000 acres of proved coal and ore lands in the center of the Warren coal and iron area in the Birmingham district in Fayette and Tuscaloosa counties, Ala., and 50,000 acres of the best brown ore land in the State of Alabama, situated to the east of the ore lands above.

It may be interesting to note that in a table of valuations the "plants in Ohio and Pennsylvania" being, as presumed, the Cuyahoga Falls and New Castle works under option, are put down at $5,865,000, while the great plant to be built at Brunswick, with its five blast furnaces, 16 open hearth furnaces and great collection of rolling mils, is entered at $7,500,000, while the proposed Utica plant is put down at $3,500,000.

The most interesting part of the document is that which deals with "Economies," which grow out of a comparison between Brunswick, Ga., and Pittsburgh. These summarized are as follows, being based on an estimated 1,000,000-ton output of steel products, which, however, is put down modestly at really one-half greater, or 1,500,000 tons.

Summary of Economies (Per Annum).

Inward freight	$5,210,000
Outward freight	3,900,000
Coal and coke	1,400,000
Labor	1,950,000
Tax exemption	150,000
Total	$12,610,000

The prospectus says:

Although the following figures are so surprising as to seem impossible, a careful study of the map of the United States will assure and investigation prove their absolute truth.

Comparison Between Pittsburgh and Brunswick.

(a) Saving on receipt of Birmingham ore:		
Birmingham to Pittsburgh, per ton	$4.40	
Birmingham to Brunswick, per ton	.75	
Saving	$3.65	
Estimated yearly tonnage 1,000,000 tons, at $3.65		$3,650,000.00
(b) Saving on receipt of high carbon ore:		
Michigan to Pittsburgh, per ton	$4.30	
Cuba to Brunswick, per ton	.40	
Saving	$3.90	
Estimated yearly tonnage 400,000 tons, at $3.90.		1,560,000.00
Total saving on yearly receipts		$5,210,000.00

In other words, if Pittsburgh manufacturers got it into their heads to carry 1,000,000 tons of Birmingham ore to that manufacturing center and paid $4.40 per ton for the amusement, then a plant at Brunswick, Ga., would have an advantage of $3,650,000 per annum over them. We do not know what future generations of Pittsburgh steel makers will do. Those living outside of an insane asylum now will not.

The "saving" under *b* puts down the cost of freight from Lake Superior mines to Pittsburgh far above the true figure, while that from Cuba to Brunswick is too low, and for the present ignores the duty on ore. Besides it assumes that ore can be purchased in Cuba as cheaply as it is mined on the Lake Superior ranges. The "outward" freight is dealt with as follows:

(c) Saving on shipments of finished products:		
Pittsburgh to Liverpool, per ton	$9.60	
Brunswick to Liverpool, per ton	3.20	
Saving	$6.40	
Estimated yearly tonnage 250,000 tons, at $6.40.		$1,600,000.00
(d) Saving on shipments:		
Pittsburgh to Boston, per ton	$3.20	
Brunswick to Boston, per ton	1.20	
Saving	$2.00	
Estimated yearly tonnage 250,000 tons, at $2...		500,000.00
(e) Saving on shipments:		
Pittsburgh to Kansas City, per ton	$6.40	
Brunswick to Kansas City, per ton	5.20	
Saving	$1.20	
Estimated yearly tonnage 250,000 tons, at $1.20.		300,000.00
(f) Saving on shipments:		
Pittsburgh to New Orleans, per ton	$6.40	
Brunswick to New Orleans, per ton	.40	
Saving	$6.00	
Estimated yearly tonnage 250,000 tons, at $6...		1,500,000.00
Shipments to Chicago and its neighborhood will be made from the Utica plant.		
Total saving on shipments as above		$3,900,000.00
Total saving on receipts		$5,210,000.00

We may note that the Pittsburgh-Liverpool rate is far from being as high as stated, that the Boston market would be taken care of by New England and Eastern Pennsylvania mills, the tonnage of Kansas City by the Chicago district and by Colorado, that Pittsburgh can and does ship to New Orleans by water, and that Birmingham will have something to say in that market. The whole compilation is absurd.

The next item of "Economies" is explained as follows:

Owning their own fuel beds and because of their close proximity to the mills, the Mohawk Valley Steel & Wire Company are able to add another saving to their long list of economies—a saving on coal and coke.

Cost to-day of coal at Pittsburgh	$1.40	
Cost to-day of coal at Brunswick	1.00	
Saving	.40	
Estimated yearly consumption 1,000,000 tons, at 40 cents		$400,000.00
Cost of coke at Pittsburgh	$5.50	
Cost of coke at Brunswick	3.50	
Saving	$2.00	
Estimated yearly tonnage 500,000 tons, at $2		1,000,000.00
Saving on fuel		$1,400,000.00

It is not true that coal is cheaper at Brunswick to-day than it is at Pittsburgh, or that the cost of coke is now or will in normal times be higher in Pittsburgh, quite irrespective of the fact that the quality is much better. How a consumption of 1,000,000 tons of coal and 500,000 tons of coke are arrived at we cannot fathom.

Labor is also to show a saving, as below:

In the item of labor the conditions that obtain in Brunswick relative to hours per day, as well as price per day, give the Mohawk Valley Steel Company advantages over Pittsburgh. Labor at Brunswick shows a clear gain of $1 a day per man. As the plant will employ fully 6000 men of this class it follows:

6000 men at $1	$6,000.00
300 days in year at $6000	$1,800,000.00
Estimated saving in clerical force	150,000.00
Total	$1,950,000.00

By legislative act the plants at Brunswick are to be exempt from taxation for a period of 15 years. This item is alone worth over $2,500,000 to the Mohawk Company and shows another saving per annum of $150,000.00

Considering the greater efficiency of labor in Pittsburgh we believe that this item would disappear altogether.

To crown the whole the prospectus claims a net profit of $15 per ton on 1,000,000 tons per annum, and a little sum of $2,000,000 of profits on the sale of coal.

It is amazing that such a prospectus should be put forward gravely, but it is more remarkable still that an

enterprise floated in this manner of the Mohawk Valley Steel & Wire Company should be as seriously considered as it apparently is.

Notes from Great Britain.

The Market.

LONDON, April 4, 1903.—The Birmingham quarterly meeting (which, by the way, was held a week in advance to avoid the Easter holidays) showed a firm and active market. There was a full attendance, manufacturers and merchants being in strong force from practically all parts of the country. A feeling of hopefulness pervaded the gathering, and undoubtedly there was a keener sense of prosperity than at the last quarterly meeting at the beginning of the year. Then there was severe foreign competition, Germany unloading with obvious eagerness. This week, however, German agents were completely off the market. In addition the consuming industries just now are well occupied. Rolling stock makers are especially well off, several substantial contracts having recently been secured, notably one for a number of larger capacity goods wagons for the Scottish railways. Indeed, a marked feature of the manufacturing trades just now is the activity in all forms of vehicular construction.

The quarterly meeting is always used by the various trade sections to push their own interests. This week two sectional meetings were held, the Axletree makers and the Galvanizers. The Galvanizers reported satisfactory business, especially from South America, and in consequence maintain their quotation, 24 gauge, f.o.b. Liverpool, £11 10s. The Axletree makers find trade good and have decided not to alter discounts. The marked bar makers held their conference a week ago, and maintain their standard of £8 10s., a price which has remained stationary for two years. The Unmarked Bar Association was not called together, but unevenness of price is a marked feature of the situation. For good merchant bars there is a fair demand, but the price is weak, generally at £6 5s. to £6 10s. Hard spelter is very scarce, and bidding is on the £19 basis.

A feature in the situation which must not be overlooked is the continuance of dear money. With the bank rate at 4 per cent. and raw material and working costs out of due proportion to final costs, it is not surprising that business men who are concerned with large transactions find their movements seriously hampered.

German Production.

The mining and metallurgical production of the German Empire for the year 1902 was as follows:

	1901.		1902.	
	Quantity. Metric tons.	Value. Thousand marks.	Quantity. Metric tons.	Value. Thousand marks.
Iron ore	16,570,182	71,999	17,963,595	65,736
Zinc ore	647,496	21,502	702,504	29,811
Lead ore	153,341	14,141	167,855	13,436
Copper ore	777,339	24,299	761,921	20,431
Silver and gold ore	11,577	1,551	11,624	1,384
Cobalt, nickel and bismuth ores	10,479	742	12,435	752
Manganese ore	56,691	703	49,812	579
Pyrites	157,433	1,142	165,225	1,285

The chief feature noticeable from the above figures is the increase of 8.4 per cent. in the production of iron ore. The products of reduction works were as follows:

	1901.		1902.	
	Quantity. Metric tons.	Value. Thousand marks.	Quantity. Metric tons.	Value. Thousand marks.
Copper ingots	31,317	46,309	30,591	34,164
Zinc	166,283	54,787	174,927	61,804
Lead, pigs, bars, &c.	123,098	32,233	140,331	31,349
Litharge	4,101	1,128	4,197	1,033
Pig iron	7,880,087	491,774	8,529,900	455,699

Discussing American Competition.

The British Iron Trade Association called a conference last Tuesday morning to consider the question of American competition. The commissioners who visited America last year, and whose report I reveiwed at considerable length in *The Iron Age* of July 3 last, each read papers, and there was some discussion. As a matter of fact the wind has been taken out of the sails of this subject owing to extraneous causes. The complete absence of America from the neutral markets, the reasonable amount of activity in the British market, the absorption of Germany in its own markets—all these have created momentarily at least a certain indifference to the whole problem. As a matter of fact, neither the papers nor the discussion disclosed any new features. The chairman is evidently disturbed in his mind as to the efficacy of free trade, and would not object to a little protection. He also complained of a lack of surplus capital, with consequent atrophy. He did not find much support from the other speakers, some of whom were not slow to point out that we had so much surplus capital that it was to be found in all parts of the world. In the main, the general feeling seemed to be that there were a certain number of iron and steel works over here that could hold their own with anything that America could produce, but that in the second grade works a deal of waking up is necessary. On the personal side of the problem it was felt that America scores heavily by giving adequate reward to its skilled employment and by leaving the direction of affairs to the most capable man. The son of the father practice, which holds good to such an extent over here, has of course a most deadening influence upon the economy of production and the general efficiency of business.

Machinery on the Rand.

H. H. Webb, the superintendent engineer of the Consolidated Goldfields Company, replying to certain criticisms made as to the lack of labor saving machinery on the Rand, writes to the chairman of his company a long letter, in which he details the efforts that have been made to introduce labor saving appliances. As so many American manufacturers are deeply concerned with supplying labor saving appliances for use in mines, I extract from the letter the essential points. The writer says:

"Every effort is being made to introduce labor saving appliances where they are not already in use, or where they could be effectively applied under present conditions. Labor saving appliances, to be effective, must be gradually evolved to meet the conditions existing on these fields. They are not like agricultural implements which are kept in stock and can be bought in the market. . . . I might say, in breaking the rock in the stopes underground, machine drills are always used, except in the case of narrow reefs where the values can be better maintained by using hand labor, though under present conditions these narrow reefs are stoped by means of machine drills also, which, however, are detrimental to good mining, inasmuch as they materially lower the grade of the ore to be sent to the mill through the increase of the amount of waste which must be broken down by this means. Efforts to supplant native labor in stoping on these narrow reefs have been tried before the war and since, by the use of small machine drills, light in construction, and drilling a hole about the same as that accomplished by hand labor, but so far these have not been entirely satisfactory—at least sufficiently so to supplant hand labor, where it can be procured, in low grade narrow reefs.

"In conjunction with the use of machine drills underground, one might say that the white labor here is the greatest opponent to the most economical working or handling of more than two machine drills, under the direction of one skilled white man with the assistance of unskilled white or native helpers. . . . As regards shoveling the rock broken in the stopes to the levels to be trammed away, efforts have and are being made to supplant hand labor by mechanical appliances here. Belt conveyors in the stopes have been tried, as at the ———, but so far have proved uneconomical. At many mines, as at the ——— and ——— in long stopes, small gravity tram lines have been put in and are in use in order to reduce the number of shovelers necessary to handle the rock broken. . . . The tramming underground hitherto has been carried on by means of natives, as the mines have been laid out with that intention. The drives as they follow the sinuosities of the reefs are exceedingly tortuous, and consequently better adapted to tramming by hand than by mechanical means. . . . Plans have already been formulated in the equipment of new deep level mines to install mechanical haulage on certain main levels, but even in these cases it will not entirely do

away with hand tramming, as more or less of it will have to be done on intermediate levels.

"From the time the rock is delivered to the ore bins at the bottom of the shaft until deposited on the dumps, it is practically handled automatically in all the mines, though improvements will undoubtedly be effected in some of the details, as, for instance, the emptying of the cyanide tanks by mechanical devices; experiments with this object are now in hand.

"Trials of other inventions are being carried on, such as the electrical furnace for heating drills underground and the use of mechanical drill sharpeners, to avoid the conveying of the drills to the surface and thus save time and labor."

The Price of Coal and Iron Losses.

A great deal of interesting matter is being made public through the German Governmental inquiry into the operation of cartels. The latest evidence has come out in connection with the Rhenish Westphalian Coal Syndicate. It is evident that the syndicate did not sufficiently reckon with the depression when fixing its prices. The result of this was that at the end of December a petition for a rebate was sent up to the syndicate from 75 rolling mills, with a yearly consumption of coal amounting to 2,000,000 tons. Having pointed out that the price of iron and steel stood from 25 to 50 per cent. lower than in the last two years, the petition proceeded:

"A small reduction of about 20-50 pfennigs per ton is, of course, quite insufficient; one of at least 1 mark per ton, rather, would be regarded as the minimum concession on your part that could be of advantage to us. At the same time the export drawback granted by you since the beginning of the year would have to be maintained, rebate notwithstanding. This drawback is extremely small in comparison with the enormous sacrifices in price which we are obliged to make in our export business. For instance, as to rolled sheet iron works, which have exported at least 50 per cent. of their production during the past year in consequence of the weak demand in the home market, the drawback you allow on every ton of finished sheet iron exported amounts to about 1 mark, in addition to which a like export bounty is paid by the Pig Iron Syndicate, whereas the mill has then to add from 15 to 18 marks more in order to cover the bare costs of production, and thus makes a sacrifice which is enormous in proportion to your small contribution. Although these great losses are incurred by the owners and shareholders of the rolling mills primarily in the interests of their employees, you certainly profit by it. . . . The export of the rolling mills and the fullest support of the same coincide with your own interest. . . . The sacrifice for the export would be less oppressive if home prices were very profitable. But, on the contrary, they are at present largely such as to bring loss, and it will be long before the home market can bear high prices. . . . In order that you may see how well founded our complaint is, we beg to inclose a list of firms which have paid no dividend in the last years."

But the really interesting aspect of this question is that while the German iron and steel concerns were suffering so severely, the firms comprising the syndicate paid on the average higher dividends than in normal times. A very striking proof, if proof were needed, that in these later days, when the consumption of fuel is such a vital part of iron and steel production, all iron and steel works should possess their own coal and coke supply.

The Training of Engineers.

LONDON, April 9, 1903.—The vexed question of apprenticeship in engineering workshops, coupled with the growing need for highly trained expert engineers in this country, is fast becoming acute. For a great many years we have been playing with the subject, but there can be little doubt that on a general review of the facts even the most enthusiastic Britisher will admit that both America and Germany excel in their arrangements for technical training. In this country apprenticeship is almost a dead letter. I mean apprenticeship in the real sense of the word. It is perfectly true that youngsters are still indentured; it is true that some trade unions still insist as a credential upon apprenticeship; but what does it all amount to? Merely that the youngster has gone into the workshop and has picked up more by good luck than by good management a number of practical tricks of the trade.

I have observed that technical education by the community is almost a political question among workmen who take a shortsighted view of their own interests. They think that if they can keep their craft and mystery well under their own control by insisting upon the old fashioned apprenticeship system they are building a wall of defense around their industry. The State enters and offers a technical training in a number of trades, and young men enter. "This," says the old fashioned trade unionist, "is a direct attack upon my trade interests," and forthwith influence is brought to bear upon local authorities to restrict technical education to the merest abstract principles.

The subject has recently been discussed at the Institution of Naval Architects by Professor Dalby, who has recently been on a visit to America inquiring into the training of young engineers in your country at the instigation of A. F. Yarrow, the well-known shipbuilder of this country. After describing the exact position of technical education in America from the Land act of 1862 and explaining the assistance offered by the Morrill act of 1890, and specifying the technical colleges, he went on to describe in considerable detail the undergraduate courses of study at Harvard, Yale, Cornell, the Massachusetts Institute of Technology, and McGill College, Montreal, showing the subjects prescribed and their distribution over the different years. He summed up by saying that what was understood by a technical education in the States was really four years of continuous hard work at a college equipped with engineering laboratories and workshops, and with all the educational apparatus for giving a scientific education.

In the second part of his paper he discussed the relations existing in America between employers and college trained men. It was generally recognized, he said, by employers in America that a man with technical training made a better apprentice and developed into a better officer than a man with only an ordinary education. The present trend of opinion among employers concerning college graduates was well illustrated by the apprenticeship rules in operation at the motive power department of the Pennsylvania Railroad Company and at the Baldwin Locomotive Works, Philadelphia.

After describing in great detail the conditions and regulations of the apprenticeship system in both these works, the professor said that, generally speaking, the attitude of the American employer toward the college graduate was one of distinct encouragement and of advantage to both. The American employer kept an "open door" for the technically trained man, while in England the door was too often closed by rules regarding age and the like, and the would-be apprentice not having sufficient means to pay a premium in addition to the amount he had already paid for his education. In cases where college graduates were taken on in England they were, as a rule, expected to go through the same course in the shops as a boy entering straight from school. The Americans were more yielding in this respect and did not insist upon the drudgery of the first few years.

Half College, Half Workshop.

The discussion that followed Professor Dalby's paper was the most interesting and suggestive at the meeting. But valuable though the previous contribution to the discussion was, the practical proposals of A. F. Yarrow secured most attention. A. F. Yarrow set himself to find the best means of obtaining a combination of scientific and practical knowledge.

Some young men after leaving public schools went direct into the workshops, where they remained, say, five years, during which time it was often found—he found so in his own case—that they forgot much that was taught them at school, and, above all, seemed to lose the power to study. There was another alternative, to go to the university or technical college immediately after leaving school for, say, a three years' course.

In that case a lad afterward entered the workshop and then often found, when it was too late, that he was not suitable to follow the profession of engineering. A third alternative was the one that had been adopted in Scotland to a limited extent and was substantially in accord with the method that for many years had been carried out by the Admiralty, of working in the shops in the summer and in the college during the winter. This plan, in the opinion of many leading authorities, offered the best combination.

Later in the discussion Mr. Yarrow gave some account of the regulations he had arrived at in concert with friends, based on information derived from Professor Dalby and others in regard to the admission of pupils to his own works. In Class A, which was for men who had obtained high honors at some approved engineering school, wages of 20 shillings a week were paid, with an annual increase of 5 shillings per week. In Class B, for non-university men from 16 to 19 years of age, the wages were 10 shillings a week, with an annual increase of 5 shillings a week; the lads had to pass an entrance examination and served a four years' term, every facility being given to attend evening classes. An alternative class, C, gave the opportunity of spending the summer in a workshop and the winter at college, though it, of course, depended on the possibility of a six or seven months' course being arranged by the colleges. In no case was any premium required.

This combination of technical and scientific education, affording as it does the best available solution of the problem, has not escaped the attention of Sir Arthur Rücker, the principal of the University of London, who has been prompt to write to the public press to make it clear that the University of London is not in any way opposed to the "sandwich" system.

The British Government and Engineering Standards.

The British Government, by a new and welcome departure, has given an immense impetus to the work of the Engineering Standards Committee by contributing £3000 to the fund of the committee. This sum is granted for one year only and on the understanding that the Government is not pledged to continue it in later years. In announcing this decision in a letter to the secretary of the committee the Board of Trade says, through its principal secretary:

> After the sum has been voted by Parliament for the purposes of the committee, the actual expenditure under the vote will have to be authorized by this Department on the recommendation of a committee, which should be specially appointed for the purpose by the Institution of Civil Engineers, and should contain one *ex officio* representative of the Board of Trade.

The Engineering Standards Committee has not been slow to close with the offer and the following gentlemen have been nominated to act upon the special committee: The president and the senior vice-president of the Institution of Civil Engineers; James Mansergh, Sir John Wolfe Barry, Sir William Preece, Sir Benjamin Baker and Sir Douglas Fox, past presidents of the institution; Archibald Denny, M. Inst. C. E., with a representative of the Board of Trade.

American Work in Uganda.

According to letters which have just reached England the American Bridge Company have completed the erection of the 27 viaducts on that line in exactly 51 weeks, and the enormous difficulties may be gathered from the fact that 23 out of the 27 viaducts had to be built on a curve. Altogether 6000 tons of steel were employed in the work, the greater part of which has been done by Indians and natives, only 25 white men having been employed. The American Bridge company have disposed of their plant rather than convey it back to the United States.

Machinery on the Rand.

H. C. Brodie, a partner in the firm of Findlay, Durham & Brodie of this city, has recently completed a tour through the South African colonies. He says that Johannesburg is rather stagnant just now, owing to the dearth of labor for the mines. Many English manufacturers who have sent out representatives have been disappointed at the small amount of business done. Mr. Brodie says that American influence and competition are very serious obstacles to British trade. He says that a large number of the mining engineers on the Rand hail from the United States, and they naturally understand and prefer machinery from their native workshops. This is in many cases the sole reason why orders go to America. As an example of the extent to which American machinery is used he mentions the new equipment of the Consolidated Main Reef mine, which with all accessories comes from the United States.

That there is keen competition between the various countries for the machinery trade of the Rand is evidenced by the keenness to supply rock drills. The makers of a certain British rock drill offer to equip any mine completely with the drill and to take over all drills of any other make which may already be installed, on the basis of one new drill for two old ones, any additions being made at a stipulated price. In addition, they offer to maintain all the drills in proper order at a fixed charge per drill per year. Other makers are, of course, not to be left behind in the race. The real point of the contest is that these British makers are endeavoring to recapture a trade which they have lost. American manufacturers will doubtless have something to say to it.

March Exports to United States.

The leading exports of metals from this country to the United States during the month of March were as follows:

		Tons.
Old iron and steel		2,142
Pig iron: From London	500	
Liverpool	8,020	
Newcastle	3,735	
Manchester	404	
Glasgow	6,360	
Hartlepool	8,820	
Middlesbrough	41,903	
Shields, South	5,500	
Swansea	135	
Dublin	930	
Hull	3,590	
Total		79,897
Bar iron		463
Rods		25
Wire and manufactures thereof		441
Galvanized and corrugated sheets		114
Wrought iron and manufactures thereof		236
Steel ingots, billets, &c		3,226
Steel bars, angles, &c		1,682
Tinned plates and sheets		5,896
Steel sheets and plates		538

The total exports of pig iron for the first quarter of the year from this country to America reached 149,631 tons, out of a total exported pig iron of 299,036 tons. The monthly export of 79,897 tons compares with March of last year, 14,845 tons. It will thus be seen that there is still a large volume of shipments westward across the Atlantic, but of course it is for orders long since placed.

A Business Purchase.

Power, Power & Co. of 5 Philpot lane, London, E. C., have purchased the good will, business and works of Deane, Ransome & Co., Limited, of Plymouth Wharf, Cubitt Town, London, E. They will continue the manufacture of girders, roof work and constructional iron and steel work generally as before. Deane, Ransome & Co., Limited, have long been associated with the engineering and allied trades, and there are doubtless a number of English readers of *The Iron Age* in America who in days gone by have had connection with this firm. S. G. H.

The report of John Williams, secretary of the Amalgamated Association, read at the convention in Columbus, Ohio, last week, showed that this organization has gained 2000 members in the Eastern district. The report of Theo. Shaffer, president, stated that there were only two strikes during the year—one at Canonsburg, Pa., which was quickly settled, and the other at Ashland, Ky., which is now in process of settlement.

The general offices of the Plano division of the International Harvester Company have been moved to the general office building of the company, at the corner of Monroe street and Michigan avenue, Chicago.

The Iron Age

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DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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The Manufacturers and the Labor Question.

The extent to which public sentiment has been aroused on the labor question is demonstrated by the proceedings of the National Association of Manufacturers at New Orleans last week. The discussion of this question overshadowed all other matters brought before the convention. Important topics which would ordinarily have attracted much attention and elicited animated discussion were given scant consideration because of the desire among those present to bring out some phase of the labor situation in which they felt particularly interested. The meeting might have been called a labor convention in view of the fact that so large a part of the time was devoted to the consideration of labor and so little to other matters. In past years the association did much to direct the attention of its members to the cultivation of an export trade. This year that once engrossing subject was almost wholly ignored. Practically the only action taken having any bearing on the export question was the adoption of a resolution urging the speedy adjustment of trade relations with Russia to terminate the war of reprisals now adversely affecting American trade with that country. Obviously, the manufacturers of the United States must have become thoroughly impressed with the belief that the urgent necessity of the hour is to counteract the growing power of labor unions or there would have been no such overpowering demonstration on this subject.

The discussion of the labor question in the convention developed a sharp difference of opinion among the members. The great majority of those present were undoubtedly in favor of radical measures against unions, as shown by the demonstrations of approval of the position taken by President Parry and John Kirby, Jr. A little band of conservatives raised their voices in remonstrance against the wholesale denunciation of labor unions, pleading for moderation and urging that no action should be taken which would inflame labor against capital. The convention being composed of level headed business men, the views of the conservatives were not only given due consideration, but were reflected in the declaration of principles and resolutions on the labor question which were adopted. A platform was thus built upon which all were able to stand. A plan was also outlined for the formation of employers' associations, to co-operate with a central body, by means of which it is hoped that labor disputes can be more successfully handled than in the past. Through such an organization it is expected that effective work can be done in adjusting labor troubles before they reach the point of a strike or lockout. But when strikes do occur, it is confidently expected that their effects can be minimized and the evils of the boycott and the sympathetic strike mitigated.

An organization of this character has a great work cut out for it. Over and above any selfish consideration of the mere financial interests of employers lie the important questions of the right of free labor in any occupation, the right of the American boy to learn a trade, the evil of restricting output and the suppression of violence during strikes. It is a difficult task, and it will certainly not be accomplished without great sacrifices by those upon whom the burden of leadership may fall.

The Conundrums of Radium.

The general facts of the curious properties of radium are probably known to every one who keeps in touch with current technical literature. The more it is studied, however, the more remarkable it becomes from every point of view, and the results of recent experiments with it are so startling and threaten to undermine so many of what have come to be regarded as the basic truths of physics that even those for whom radium has no immediate or practical interest should be advised of its surprising phenomena. At the moment pitch-blende is the storm center of scientific controversy and the focal point of scientific interest. In it may lie a new source of power which will revolutionize not only mechanics, but possibly physics and chemistry as well.

Up to quite recently radium was regarded much as calcium chloride had been in the days when luminous paint was a curiosity. It was known to possess the power of radiating light, but was supposed to possess this quality by reason of the fact that it had absorbed light from the sun's rays. The extremely interesting discovery of Sir William Crookes that the ions, or atomic emanations, from radium could be rendered visible changes the point of view from which this extraordinary mineral must be regarded. Professor Lippmann of the Sorbonne, whose standing in France is equivalent to that of Lord Kelvin or Lord Rayleigh in England, seems to have established the fact that radium has the power of continually generating heat without drawing upon any external source of energy. If this be true, every one with the least or most superficial knowledge of physics will see at a glance that this phenomenon gives us a new science and compels a revision of our accepted ideas on many subjects. As has frequently happened before, Crookes' discovery of the heat generating properties of radium, while it comes like a revelation, is merely the recognition of properties inherent in many kinds of matter, and previously suspected, if not accurately described. The difference appears to be that radium possesses these properties in higher degree than any other substance at present known. Some of our readers, with a taste for excursions into the by-paths of scientific literature, will perhaps recall the generalizations of Seguin in explanation of a phenomenon which had puzzled the physicists. It was noticed many years ago that a coin or a print, if shut up in a box in proximity to, though it may not be in contact with, a sheet of blank paper, was found in time to have impressed its own image upon the blank sheet by a process of photography chiefly, if not exclusively, operative in the absence of solar light. These pictures were at first regarded as profound mysteries, explainable only by assuming that superhuman agencies had produced them. Seguin suggested the explanation that the bodies capable of producing this phenomenon did so by giving off a stream of impalpable particles projected from themselves with high velocity, and that these particles were capable of producing an impression upon what they bombarded. His hypothesis was received with hilarity by the physicists, to whom the idea of such a radiation of matter, even in infinite attenuation, going on forever without any sensible loss of weight or bulk in the mass drawn upon, was inconceivable. For that matter it is inconceivable still, but it is becoming evident that Seguin discovered the only explanation of a series of phenomena which find their highest known development

in the behavior of uranium and radium. The matter was practically forgoteen until 1896, when Becquerel, in the course of some interesting and important experiments with the salts of uranium, observed that they maintained a constant radiation, that the rays thus given off possessed in common with the X-rays of Röntgen the astonishing power of passing through substances distinctly opaque to solar radiation, and that the rays thus transmitted through plates of metal, for example, were able to make a distinct impression upon a sensitive plate which would be acted upon by the actinic rays of solar light. If a small mass of uranium was inclosed in a light tight box with a photographic plate, and an opaque object was interposed between them, the form of that object was distinctly reproduced upon the plate as in the shadow pictures of the Röntgen skiagraphs. The novel feature of the radiation from a crystal of any of the uranium salts was that apparently no exciting cause was needed to produce or maintain it. In the case of the Röntgen rays the application of external energy is necessary to excite the vacuum tube and produce the X-radiation. Uranium, however, has this energy within itself. Its radiation appears to go on continuously and is apparently unaffected by any treatment to which the crystal is subjected, such as heating, electrification or solution in acid. If this be true, and all observations thus far made warrant the belief that it is, the axiom of physics that all energy is but the mechanical equivalent of energy previously exerted to produce it, and that all work is but a credit to balance a debit previously recorded, would seem to need revision. The later experiments of Becquerel, and of M. and Mme. Curie, with uranium and the last addition to the group of elements found in association with it, radium, give us phenomena which in their relation to other phenomena so universal as to warrant the formulation of laws which have thus far not only passed unchallenged, but have satisfactorily accounted for pretty much everything dynamical, may very well pass to classification as miraculous. The fact that they are not miracles, but are manifested in obedience to a well established natural law of invariable operation, has caused the physicists to look at one another and ask if it can be true that modern science has builded upon a cornerstone which has crumbled under it.

The assumption that the Becquerel rays, which have been recognized as originating in certain new elements of which radium is the most active of those thus far known, are not streams of material particles forever flowing from their source without diminution or change, but mere vibrations of ether, like the Hertzian rays employed in wireless telegraphy, would have saved a great deal of trouble, but unfortunately this was rendered untenable by the discovery that if such a stream of radiant energy was allowed to fall upon an electrified body it would discharge it precisely as a jet of tangible water would do. And now Crookes has made these rays visible, and Professor Lippmann has established the fact to the satisfaction of the French Academie des Sciences that radium is capable of producing sensible heat *ad infinitum*, without consuming itself or anything else so far as can be determined.

Whether these discoveries have any economic value or not is of less immediate concern than the effect they will have on science. A century ago they would have been regarded as establishing the hypothesis of phlogiston as a property of certain kinds of matter, and we should be compelled to regard radium as the most highly phlogisticated of known substances. Probably we can do better, however, than to go back to that particular starting point for a new departure. Meanwhile two questions of great interest will probably occupy the physicists for some time to come. One is, what property of matter permits any form of it to maintain a practically eternal energy in expelling a stream of fragments of its own mass? The other is, what is the form of matter thus projected? It has been assumed with some show of plausibility, as the result of calculations from the imperfect data now available, that the radiation of radium would in about ten thousand millions of years reduce the mass about 1 grain in weight for each square inch of surface. Obviously it cannot be projecting the atoms of the Dalton hypothesis. These units of the molecular groupings, however small, would exhaust it at a much more rapid rate than that assumed in the case of radium. The form of matter expelled must be infinite subdivisions of the mathematical unit called the atom; perhaps the primordial matter of the alchemists. The narrow door thus placed invitingly ajar may lead to truths of which the students of the middle ages had a clearer perception than those of modern times, who know more and dream less, and whose imaginations are hampered by the desire to prove all things. It may be we shall be no happier and no better off when we know why radium behaves in a fashion so extraordinary; but the world is full of wise men who cannot rest until they do know, and it may very well happen to them, as it has to others, that in searching for the end of the rainbow they will find a great many things they were not specially looking for which are of immediate and immeasurable utility. That we could not usefully employ radium if we had it in masses is probably due to reasons which have discouraged the search for the universal solvent—we have nothing to keep it in.

The Force That Governs Immigration.

The unprecedented prosperity which is still the prominent feature of American industrial life continues to attract an increasing number of immigrants from European countries, and naturally, as the demand is for laborers, the lower classes of foreign population are being drawn upon, which fact is being lamented by Government officials and deplored by the average man who fails to take a broad view of the situation. It is of course desirable that the population of the United States should not be further diluted by men of low vitality, of small intelligence and of immoral tendencies; but so long as there is a demand for "the hewers of wood and drawers of water" we must expect those who are willing to accept such occupation to be drawn to us.

Yet it is to the naturalization laws rather than to those governing immigration that we must look for protection. We are not obliged to make citizens of the raw material which industrial demands are assembling; we can control, if we will, to a large extent, what we may term the manufactured human product.

There is some weight in the contention that we attract so-called pauper labor from abroad as a result of refusing their material products while at home and thus to enable them to stay where they are and improve themselves to a point where they would be desirable importations. Economic forces are compelling the cheapest kind of manual labor to seek our shores, and it is only when the demand falls off that this current will subside.

It is interesting to note that during the first three months of the present calendar year 126,550 immigrants arrived at the port of New York, as compared with 104,937 during the corresponding time in 1902, which was the high record number at that time. At the rate of the present movement our importations for the year would exceed 500,000 at New York alone and at all ports would probably exceed the record of 1882, when 788,992 foreign-

ers arrived in the United States. Of the human arrivals for the first quarter of the year considerably more than half were Italians, the next largest number hailing from Poland.

During the first ten days of April over 38,000 aliens, a record breaking number, landed at Ellis Island, and of this number a large portion is said to have remained in New York, but a greater proportion than usual were destined for the West and Northwest. It is noted that the quality of the April contingent is said to have shown improvement over the previous arrivals of the year, being of higher average education, but this fact seems to reflect the demand which has recently been stimulated in the farming sections of the Northwest for settlers and home seekers.

The important point to note is that in large measure economic forces govern the quality of our alien population.

Future Imports of Pig Iron.

From now on writers on economic subjects will probably express surprise again and again that the imports of pig iron do not drop off as suddenly as they might have been led to expect, and much curious comment is likely to follow. As a matter of fact, import statistics measure business often done long ago and really possess only a historical value. In considering the question of the imports of pig iron it is necessary to differentiate. Our purchases of pig iron abroad include foundry iron, Bessemer and low phosphorus pig and spiegeleisen, each of which is affected by its own set of conditions. On the whole, the purchases of foundry iron since the beginning of the current year have been light. A large part of the tonnage was bought for quick delivery, and probably little additional iron of this character will come forward on that account. Importers may be tempted, too, to resell abroad.

The quantity of low phosphorus pig purchased for consumption in this country has probably been more considerable, in larger individual blocks and for more extended delivery. Therefore the import movement in this branch seems likely to continue larger.

Finally, there have been some large sales of foreign spiegeleisen, which will be needed by the steel makers, since our own output in this branch of manufacture will probably not expand much during the next few months.

It is, of course, impossible to arrive at any figures which may measure the relative quantities of these three groups of pig iron imports, or, even less, to state what tonnage is contracted for for future delivery, but it is probably safe to state that comparatively little foundry iron is now booked for shipment to this country. In other words, we may expect to witness quite a sharp decline in the tonnage imported, and then a continuance on a moderate scale of arrivals of foreign pig, which will represent almost exclusively low phosphorus pig and spiegeleisen.

The sliding scale has become, justly, a favorite method for the settlement of wages in the American iron and steel trades, but one of its most serious problems has been to arrive at a fair minimum, which shall not put the manufacturers at a very serious disadvantage in times of depression. The past has proven that the markets do not halt in their downward tendency when minimum sliding scale prices are reached, but that at times they descend to figures little dreamt of when the agreements were made. It is in times like the present that such a contingency is only too often overlooked, so that it may be well to sound a warning.

Changes in the Canadian Tariff.

TORONTO, April 17, 1903.—The tariff resolutions introduced by the Finance Minister in his budget speech yesterday add the following sections to the Customs Duties Act of 1897:

The Governor in Council may, by order in Council, direct that a duty of $7 per ton shall be imposed in Schedule A on all iron and steel railway bars, or rails in any form for railways, imported into Canada, and from and after the publication of such order in the *Canada Gazette*, such duties shall be levied, collected and paid on all such rails, and thereafter item 238 in Schedule A and item 585 in Schedule B shall be repealed. Provided, however, that such order shall not be passed until the Governor in Council is satisfied that steel rails of the best quality, suitable for the use of Canadian railways, are being manufactured in Canada, from steel made in Canada, in sufficient quantity to meet the ordinary requiremetns of the market.

Articles which are the growth, produce or manufacture of any foreign country, which treats imports from Canada less favorably than those from other countries, may be subject to a surtax over and above the duties of Schedule A, such surtax in every case to be one-third of the duty as fixed by such Schedule A. Such surtax shall apply to any article the chief value of which was produced in such foreign country, although it may have been improved or advanced in value by the labor of another country, notwithstanding the provisions of the British preferential tariff and regulations thereunder. Any question arising as to any foreign country or goods coming under the operation of this section shall be decided by the Minister of Customs, whose decision shall be final. The Minister of Customs, with the approval of the Governor in Council, may make regulations for carrying out the purposes of this section. Such surtax shall not apply to any goods actually purchased on or before April 16, 1903, by any corporation, firm or persons in Canada, for immediate transportation to Canada.

That the period of exemption from duty of machinery of every kind, and structural iron and steel for use in the construction and equipment of factories for the manufacture of sugar from beet root, be extended to June 30, 1904.

That item 409, in Schedule A, respecting duty on ships and other vessels built in foreign countries, and applying for Canadian register, be repealed.

That machinery and appliances of a kind not made in Canada, for exclusive use in alluvial gold mining, be added to the free list until June 30, 1904.

Steel Rails.

Mr. Fielding stated his reason for providing conditionally for a duty on steel rails as follows:

For the past year the manufacture of rails has been carried on to some extent in connection with the great enterprises at Sault Ste. Marie. The Government, recognizing that industry as one deserving of encouragement, gave the company a large order for rails, which the company was only able in part to fill. We have not been unwilling to view with favor a proposal to extend to this manufactory the same degree of tariff encouragement which is enjoyed by most of our industries. But we have hesitated to do this in this case for two reasons: first, because we were not satisfied that the mill at Sault Ste. Marie was in a position to supply the quantity of rails required by the Canadian market, and we were not quite satisfied that it was able to make rails which would be up to the standard of quality required by the Canadian railways, and it therefore seemed to us that the imposition of a duty under these conditions would not serve its purpose. We have decided that while we would be justified in imposing the duty now, we may reasonably ask the House to agree to a duty to take effect when there are rail mills either at Sault Ste. Marie or elsewhere in a position to turn out rails of proper quality and in reasonable quantity. We therefore ask that power be given to the Governor in Council to impose a duty of $7 per ton on steel rails, provided, however, that such order shall not be passed until the Government is satisfied that there are rail mills in Canada making the best quality of rails in a sufficient quantity to meet the reasonable demands of the market. This duty when imposed will, of course, be subject to the British preference as usual.

Hence when the duty is brought into force it will be $7 as against the United States; one-third less, leaving the rate $4.66 2-3 per ton, as against Great Britain; one-third more, making the rate $9.33 1-3 per ton, as against Germany.

Retaliation Against Germany.

The second of Mr. Fielding's resolutions, given above, is aimed at Germany, for that is the only country which treats imports from Canada less favorably than it does imports from other countries. Since 1897 Germany has denied Canadian grain the benefit of the favored nation clause of its tariff, the result being that the sale of Canada's wheat and other cereals in the German market has been prevented from increasing. The German Government took the ground that Canada had forfeited the privilege of favored nation treatment by granting to Great Britain a preference it refused to Germany. To

the contention that such preference was purely a domestic affair, kept within the limits of the British Empire, Germany paid no attention. The German sense of grievance was aggravated when at Sir Wilfrid Laurier's instance, and solely for the purpose of releasing Canada, the British Government denounced its commercial treaty with Germany. It afterwards negotiated a provisional treaty with Germany, wherein the advantages of the former convention were continued to Britain but withheld from Canada.

Though for nearly six years Germany has thus practically excluded Canadian farm products, Germany has enjoyed the benefits of the Canadian general tariff. More than that, it has been admitted to the privileges of the preferential tariff to a considerable degree. That came about in this way: All goods coming from the United Kingdom were entitled to the preferential reduction of 33 1-3 per cent. from the regular tariff rates if 25 per cent. of the value of such goods was conferred by British labor, no matter whence the remaining 75 per cent. of their value was derived.

Germany, more than any other country, was the foreign source of the non-British part of articles merely finished in the United Kingdom and exported hither. So Germany got the benefit very largely of the preference. Indeed, the German article very often underwent but nominal change in the British workshop before being entered here at the preferential duty. This is to be changed by the surtax of 33 1-3 per cent. of the regular duty which is now to be imposed on German goods, and which is to be applied without regard to any processes the German article may have passed through in Great Britain.

Henceforth instead of a discount of one-third the regular duty the German product finished in the United Kingdom will be subject to a premium of one-third of the regular duty, the same as if it were wholly made in Germany. Last fiscal year Germany directly sold goods in Canada to the value of $8,021,405, and bought Canadian goods valued at $2,141,552. In the last six years Germany's direct exports to this country amounted to an aggregate value of $41,807,200, and its imports from Canada in the same period came to $9,717,435. It would seem probable that the discrimination against German goods now decided on would transfer the demand hitherto served by that country to the United States.

Canadian retaliation was further provoked by the following clause of the new German tariff:

Dutiable goods proceeding from States that treat German ships or products less favorably than those of other nations may without prejudice to the tariff duties be burdened with a surtax ranging up to 100 per cent. of the tariff duty imposed on such goods, or even with a surtax equivalent to the total value of the goods themselves. Goods free of duty in virtue of the tariff may under the same conditions be taxed with a duty not exceeding 50 per cent. ad valorem.

No General Revision.

Mr. Fielding adverted to the agitation for a general revision of the tariff, and expressed the belief of the Government that the circumstances of the country did not call for such horizontal change. The manufacturers who petitioned for increased protection did not themselves, he said, base their arguments on present conditions, but pleaded the possibility of depression. Besides the continuance of prosperity under the present tariff, he gave two other reasons for refraining from a sweeping revision just now. First, the question of mutual preferences between Britain and Canada is pending. It was not fully disposed of at the Colonial conference in London. A reasonable time ought, Mr. Fielding said, to be allowed for the British Government to consider whether it will exempt Canada wholly or partly from the grain and flour duties, or otherwise make some concession equivalent to the Canadian preference in favor of Britain. That such concession will be forthcoming is not, however, to be confidently inferred from Mr. Chamberlain's frank description of the Canadian preference as of no benefit to the United Kingdom. If the British do nothing, Mr. Fielding hints that the Canadian preference in favor of Britain may after due delay be withdrawn.

The other matter which ought to be closed up before a reconstruction of the Canadian tariff should be undertaken is the completion of the labors of the Joint High Commission. Mr. Fielding read the letter of Senator Fairbanks proposing a resumption of the sittings of that body, and read also Sir Wilfrid Laurier's reply, asking that the matter be postponed till the summer. On this subject the Finance Minister said:

While not disposed to clamor for reciprocity, and while Canada would assume a dignified and proper attitude, and while we could not again approach our American friends with a request for reciprocity, yet if the United States in the light of recent events were disposed to take a more liberal view of the question of trade relations between the two countries and manifested a desire to have the High Commission reconvene, Mr. Fielding intimated that the Canadian Government would meet them in a fair and generous spirit in any reasonable efforts to bring about a readjustment honorable to both and advantageous to Canada.

Apart altogether, however, from present prosperity and the pending state of negotiations for reciprocity with Britain and with the United States, Mr. Fielding expressed himself as indisposed to grant any tariff changes on the side of extreme protection. This speech is not encouraging to the Manufacturers' Association.

C. A. C. J.

The Chicago Metal Trades Association.

A general meeting of the Chicago Metal Trades Association was held on Friday evening, April 17, at the Grand Pacific Hotel, Chicago. The association listened to a report of the special committee appointed at its previous meeting to prepare a reply to the demands of the International Association of Machinists, the International Brotherhood of Blacksmiths and the Chicago Metal Workers' Council No. 1. The statement of the machinists' position has already been published, and the proposed agreements of the blacksmiths and metal workers are appended.

A conference committee was appointed by the Metal Trades Association to take up the propositions of the various unions with similar conference committees appointed by the unions. Should a settlement fail to be reached by this means it is proposed to submit any differences to arbitration.

Preceding the business meeting a banquet was held and an address upon "Organization" delivered by Frederick W. Job, Secretary of the Employers' Association.

Agreement.

TO WHOM IT MAY CONCERN:

Agreement entered into between the International Brotherhood of Blacksmiths, party of the first part, and ....., party of the second part, this ..... day of ..... 1903.

WHEREAS: This agreement is entered into by the parties hereinbefore mentioned for the purpose of cementing that friendship and harmonious relation that should exist in all well regulated industrial establishments; and

WHEREAS: The party of the first part does hereby agree to carry out the provisions of this agreement faithfully and honestly, and we agree to perform honorable service for the remuneration hereinafter mentioned; and

WHEREAS: The party of the second part agrees to faithfully comply with all the conditions hereinafter named—to wit:

ARTICLE 1. We agree to employ none but International Brotherhood of Blacksmiths or their members.

ARTICLE 2. The standard working time shall be nine (9) hours per day.

ARTICLE 3. Helpers will not be advanced to the detriment of blacksmiths. Should a helper be advanced to fire he shall immediately receive 15 per cent. increase in wages and he shall receive 15 per cent. increase every six (6) months thereafter until he receives the wages of a competent blacksmith.

ARTICLE 4. All time over the regular nine-hour day shall be paid at the rate of time and one-half, until twelve (12) p.m., after which double time shall be paid. Double time shall also be paid for Sunday and all legal holidays, such as New Year's, Washington's Birthday, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas.

ARTICLE 5. One (1) apprentice will be employed at each principal shop, irrespective of the number of blacksmiths employed, and one additional apprentice may be employed to every five (5) blacksmiths. This rule is not to affect apprentices in service. Any apprentice shall serve four (4) years. He shall in no case leave the service of the company without just and sufficient cause, and shall receive twelve (12) cents per hour for the first six (6) months, with an increase of twenty-five (25) cents per day for every six (6) months thereafter until he shall have served the required four years. At the expiration of his time he will be rated as a competent blacksmith in his locality, and a service letter shall also be given him at the expiration of his four (4) years' apprenticeship.

ARTICLE 6. Blacksmiths or apprentices shall not be discharged or suspended without just and sufficient cause. If discharged clearance must be given showing actual cause of dis-

charge. If after proper investigation it shall be found that a blacksmith has been unjustly discharged or suspended, he will be reinstated. The investigation to take place within five days after the discharge or suspension. The shop committee shall have power to act and treat with the officials in regard to said case.

ARTICLE 7. The company will not in any way discriminate against any blacksmiths or apprentices who from time to time represent the organization of blacksmiths and apprentices on committees, duly authorized to interview the management.

ARTICLE 8. Hammersmiths shall receive no less than forty (40) cents per hour. Blacksmiths, Bradley hammer men, spring makers, bulldozers and bolt headers shall receive no less than thirty (30) cents per hour. On and after May 1, 1903, all the above mentioned shall receive an increase of 10 per cent. in wages.

ARTICLE 9. On and after May 1, 1903, any blacksmith receiving employment shall receive the rate of wages previously paid on the fire that he is about to be employed on, with an additional ten (10) per cent. increase in wages.

ARTICLE 10. A blacksmith shall be considered a competent man in his class and be able to take a piece of work pertaining to his class, with the drawings or blue prints and prosecute the work to a successful completion within a reasonable time.

ARTICLE 11. On and after May 1, all blacksmiths now employed shall receive an increase of ten (10) per cent. in wages over the rate of wages received by them at the time of making this agreement, and no blacksmith shall work longer than six (6) days without being informed of the rate of wages he is to receive.

ARTICLE 12. In case either the party of the first part or the party of the second part wish to change the above agreement, a notice of thirty (30) days is to be given of the proposed changes.

ARTICLE 13. In case that parties hereto are unable to settle matters of difference arising under this agreement, the matters of difference shall be submitted to a board of arbitration.

ARTICLE 14. The foregoing articles are accepted as signed below and shall be in effect May 1, 1903.

(Signed.)

Articles of Agreement.

Agreement entered into by and between ....., the party of the first part, and the Chicago Metal Workers' Council No. 1, the party of the second part, to go into effect the ..... day of ....., A. D. 1903, and to remain in full force until the ..... day of ....., A. D. 1904.

ARTICLE 1. The party of the first part hereby agrees that nine (9) hours shall constitute a day's work, with a 10 per cent. increase on wages now being paid.

ARTICLE 2. That time and one-half shall be paid for overtime and double time shall be paid after 12 o'clock midnight, also for Sundays and the following legal holidays: New Year's Day, Decoration Day, Fourth of July, Thanksgiving Day, Christmas Day; and under no circumstances will a member of the United Metal Workers' International Union be allowed to work on Labor Day.

ARTICLE 3. The parties of the first part agree to employ none but members of the union or those who shall signify their willingness to join within six (6) days after such employment.

ARTICLE 4. Any disputes arising between the parties of this agreement shall be settled by arbitration in the following manner: By the party of the first part selecting one person as a member of an arbitration committee, and the party of the second part will select the second member of said committee, and the two so selected shall agree upon the third, which will form an arbitration committee of three. The decision of this committee shall be final and binding on both parties to this agreement, but it is agreed to and understood by both parties to this agreement that during the time that the aforesaid arbitration committee may have any matter under consideration no strike or lockout shall be declared by either party to this agreement. The decision of said arbitration committee shall take effect and be in force from the date said committee went into session.

ARTICLE 5. It is further understood and agreed by and between the parties hereto that the scale of prices hereby adopted and agreed to shall remain in full force during the time of this agreement, and if either party to this agreement shall desire a change at the end of such period notice shall be served upon the opposite party at least thirty (30) days prior to the expiration of this agreement.

Dated this ..... day of ....., 1903.

The Tallapoosa Furnace.—The litigation of Chester R. Baird and Harold L. Cheney of Philadelphia *vs.* Stephen N. Noble, which has been pending in the United States Court, at Atlanta, Ga., was settled on the 9th inst. Jointly they bought the Tallapoosa Blast Furnace, at Tallapoosa, Ga., for $7500 in May, 1902. There was a dispute among the partners and litigation followed. After the plaintiffs had presented their case the litigation was settled by Noble paying Baird and Cheney $30,000 for a one-half interest.

J. S. Randles, chairman of the Moss Bay Hematite Steel Company, has been elected president of the British Iron Trade Association.

MANUFACTURING.

Iron and Steel.

The Parkersburg Iron & Steel Company, Parkersburg, W. Va., manufacturers of iron and steel sheets, are contemplating making some extensive improvements and additions to their plant. These will include the building of eight puddling furnaces, two charcoal furnaces and three knobbling furnaces, as well as a 3000-pound steam hammer. While these additions will no doubt be made, they have not as yet been definitely decided upon, but will be in a very short time. The company propose to make iron sheets from hammered iron blooms. They have two bar mills and six hot mills in full operation, and recently started up their stamping plant, which was completed a short time ago. In this new department they manufacture patent nested stove pipe, dripping and bread pans, stove pipe elbows, metal lath, box band, &c.

The stockholders of the Juniata Steel & Iron Company, Greencastle, Ind., have given an option on the tin plate plant to Pittsburgh, Pa., capitalists, good until September 1, for $300,000 cash.

The American Tin Plate Company have recently added 12 additional tin mills to the National works, at Monessen, Pa., making a total of 20 hot mills at that plant, all of which are in full operation.

The Eagle works of the Republic Iron & Steel Company, at Ironton, Ohio, have closed down until about July 1 for the purpose of making some extensive improvements and repairs.

The Clairton Steel Company of Pittsburgh expect to blow in the first of their three blast furnaces at Clairton, Pa., during this month. A second stack will be ready by June and the third stack in July or August. These three furnaces are each 20 x 85 feet and will have a combined daily capacity of about 1200 tons. At present ten furnaces are being operated in the open hearth department, and some excellent records for output are being made. In one day recently the blooming mill turned out 944 tons of billets, 4 inches and larger.

Some excellent records for production are being made at the Laughlin works of the American Tin Plate Company, at Martin's Ferry, Ohio. This plant contains 23 hot mills, being the third largest plant owned by the American Tin Plate Company.

The Wheeling Steel & Iron Company are installing a continuous mill at their Belmont works, in Wheeling, W. Va. This mill will have a number of new and important labor saving devices.

The new blast furnace which the Carnegie Steel Company will erect at New Castle will be known as the Mrs. McKinley. The company have a large furnace nearby known as the McKinley.

The Damascus Nickel Steel Company of Pittsburgh, operating a crucible steel plant at Carnegie, Pa., have decided to install two small acid open hearth furnaces, together with three stands of 16-inch rolls and one stand of 10-inch rolls. Contracts for these mills have been placed with the Wheeling Mold & Foundry Company of Wheeling, W. Va. The plant of the Damascus Nickel Steel Company is running full time, the product being Damascus and nickel tool steels.

The West Jersey Tube Works, Bridgeton, N. J., manufacturers of wrought iron pipe, will start up their puddling mills May 4. It has been a long time since these mills have been in operation, and the company have spent a large amount of money in improvements.

The Carpenter Steel Company of Reading, Pa., have begun work on the contract for 4000 7, 8 10 and 12 inch projectiles awarded the firm by the United States Navy Department. The company have placed a bid for shells for the army.

Improvements at the Eleanor Iron Works, in Hollidaysburg, Pa., which had been postponed pending the settlement of a dispute between the iron company and the Pennsylvania Railroad Company, have been resumed. The dispute concerned a property line, and the resumption of work is taken to indicate a final settlement in favor of the iron company.

The Bethlehem Steel Company, South Bethlehem, Pa., are manufacturing a large quantity of ordnance for the Mexican Government. Senior Commander G. Miranda inspected the work last week. The steel company this week paid out $108,000 in semimonthly wages, the largest amount in the company's history.

Regarding the reports that the Eastern Steel Company of Pottsville, Pa., are to absorb the Tidewater Steel Company of Chester and other companies, the Eastern Steel Company advise us that they know nothing about it.

The Bon Air Coal & Iron Company, Nashville, Tenn., have entered into a contract with the Nashville, Chattanooga & St. Louis Railway for the construction of a railroad from Ravenscroft, Tenn., where they have now in operation their first shaft mine, to Eastland, 7 miles farther east. At this last named point the company are opening a drift mine and have begun the construction of 200 coke ovens for the manufacture of furnace and foundry coke. They are also doing a good deal of other development work, and by the end of the present year

expect to largely increase their output of pig iron, coal and coke.

The John A. Roebling's Sons Company, Trenton, N. J., have increased the wages of their employees from 8 to 10 per cent.

It is said that the sheet mills of the United States Steel Corporation at Sharon, Pa., will in the future turn out black plate for use in the various plate mills of the American Tin Plate Company. Necessary changes in the equipment of the plant are now being made.

Joseph Riddall of Sharon, Pa.; William Wallace of Warren, Ohio, and M. E. Coombs of the American Steel Hoop Company have been appointed to appraise the plant of the Continental Iron Company, at Wheatland, Pa., which is to be offered for sale within a short time.

The new open hearth steel plant of the Sharon Steel Hoop Company, Sharon, Pa., has been completed and put in operation. The works contain four 30-ton furnaces and will have a daily output of about 250 tons. The rolling department contains a blooming mill and combination billet and sheet bar mill. Of the output about 125 tons per day will be used in the manufacture of cotton ties, steel hoops and bands, while the balance will be sold in the open market.

General Machinery.

The Billings & Spencer Company of Hartford, Conn., are filling a contract for Sir Charles Ross of Scotland for all the forged parts for the new military rifle which he is manufacturing for the Canadian Government, who will equip the Canadian troops with that arm. The order comprises the parts for 15,000 rifles. They are shipped to Sir Charles Ross' factory at Quebec. The Billings & Spencer Company have just finished the order for the United States Government of 43 drop hammers for the Rock Island arsenal. In these machines are 890,400 pounds of metal.

The Stirling Blower & Pipe Mfg. Company of Hartford, Conn., are very busy, some orders now on their books being dust collecting systems for polishing and buffing rooms for the Rathbone Stove Works of Albany, N. Y.; Miller's Falls Company of Miller's Falls, Mass.; Western Electric Company of New York; Underwood Typewriter Company of Hartford, Conn., and International Silver Company for factory H, at Meriden, Conn.; factory C, at Bridgeport, Conn., and factory J, at Waterbury, Conn.; tumbling barrel dust collecting systems for the foundries of P. & F. Corbin of New Britain, Conn.; Berwick Malleable Company of Berwick, Pa., and Kelly & Jones Company of Greensburg, Pa.; shaving and sawdust exhaust and furnace feeding systems for the Lord & Burnham Company of Irvington, N. Y.; Western Electric Company of New York; the Sitterding, Carneal, Davis Company of Richmond, Va.; Ordnance Department United States Army, Frankfort, Ky., arsenal; Holland, Graves, Maubert & George, Buffalo, N. Y., and Fore River Ship & Engine Company, Quincy, Mass., and dust collecting systems for rag cutting and dusting machines for the Mittineague, Mass., Paper Company; Crane & Co., Dalton, Mass., and B. D. Rising Paper Company, Housatonic, Mass.

The Keystone Driller Company, whose plant at Beaver Falls, Pa., was recently destroyed by fire, have decided to rebuild the works at that place, having received a bonus of $35,000 from the Board of Trade. The new plant will have a much larger capacity than the old one. The company are manufacturers of drillers of all kinds.

The Pratt & Whitney Company of Hartford, Conn., are occupying the two additions recently built by them. That for the machine department is wholly occupied, while the addition for the small tool department is running nearly full. Business at these shops is very heavy.

The Sigourney Tool Company of Hartford, Conn., are building a large addition to their plant, which will be ready for occupancy in a short time. The new building is 45 x 200 feet and, with a well lighted basement, is four stories in hight. The company are to add two new lines to their product, but are not yet ready to announce what the new lines will be. At the present time the company manufacture sensitive drills and special machinery.

The daily press reports greatly exaggerate the damage done by fire April 15 to the works of Pawling & Harnischfeger, Milwaukee, Wis. But one of the seven buildings was burned, and the fire will cause only a few days' delay, as they are readjusting their plant to take care of the work.

The Vaughn Machine Company are making some extensive additions to their plant in South Peabody, Mass. A brick and frame building, 44 x 117 feet, is being erected; a steel blacksmith shop, 35 x 50 feet, is to be built, and the construction of a brick erecting shop, 50 x 200 feet, is contemplated. These extensions will be equipped with modern tools, and when completed will materially increase their facilities for turning out work.

The Soco & Petler Machine Shops, Biddeford, Maine, manufacturers of cotton machinery, are about to begin the construction of a large machine shop.

Application for a charter for the E. G. Smyser's Sons Company of York, Pa., will be made May 11. The incorporators are George P. Smyser and Henry M. Smyser of York, and James A. Smyser of Baltimore, Md. The company manufacture machinery.

R. C. Greer of New York has purchased the J. M. Reber Machine Works, on Willow street, at Lebanon, Pa.

The Cornwall Railroad Company will build at West Lebanon, Pa., a shop, 63 x 140 feet, for the erection of locomotives. The railroad is controlled by the Lackawanna Iron & Steel Company.

The American Seeding Machine Company, Springfield, Ohio, advise us that they will not decide upon the enlargement to be made to their various plants until some time in June or July.

The New York Blower Company, Bucyrus, Ohio, are shipping two very large blowers to St. Louis as part of the equipment of the Exposition.

The recently incorporated Owensboro Forging Company, Owensboro, Ky., have taken over a plant formerly at Mansfield, Ohio, and will make bow sockets and other irons for buggy and surrey tops. S. R. Ewing is president.

Power Plant Equipment.

The Birmingham Boiler Works, Birmingham, Ala., will start a branch works at Gadsden, to provide the necessary facilities to take care of the large amount of furnace construction work booked for this year's business. It is not yet known what additional tools will be required.

Daniel Ashworth and S. A. Williamson of Pittsburgh have organized the Pittsburgh Boiler & Engine Company, with offices at 904 Park Building, Pittsburgh. The new company will handle a complete line of horizontal and vertical engines, tubular and water tube boilers, &c.

The Forsyth Pattern Company of Youngstown, Ohio, have recently taken contracts for patterns for two of the largest blowing engines ever made. They are cross compound and vertical blowing engines, 54-inch high pressure, 102-inch low pressure steam, 108-inch air cylinders and 60-inch stroke. These engines are being built by the Wm. Tod Company of Youngstown for No. 4 blast furnace, to be built by the Carnegie Steel Company at the Ohio works, Youngstown.

Chas. L. Henry, Indianapolis, one of the three leading interurban magnates of Indiana, and now engaged on a line from Indianapolis to Cincinnati, is considering the installation of a turbine engine in the main power house for that line at Rushville, Ind. So far as he has investigated the engine's merits he finds that the first cost of machinery will be 25 per cent. less and the cost of operating 10 to 12 per cent. less. Another advantage is, he says, that a 10,000 horse-power turbine engine will require a space only 15 feet square and 25 feet high. The engineers of the road, Sargent & Lundy, Chicago, will not yet recommend the engine as perfected, but Mr. Henry says he is willing to delay the operation of the road a few months in order to get one of the engines.

The Providence plant of the American Locomotive Company is rushed to its fullest capacity with orders ahead to keep the same pace for six months at least. Since the new owners took possession the works have resumed the busy condition which used to exist before the depression came which shut them down entirely. The old machinery has been replaced to a considerable extent, and it is understood that the work of renovating the equipment is not yet completed.

The Peerless Economizer Company have been incorporated at Indianapolis, Ind., by S. A. Morgan and Clinton E. Morgan of that city and P. J. Snowden, Elmer Todd and Harry E. Hainy of Elwood, to manufacture a fuel economizer invented by Mr. Snowden. The company claim to build the apparatus under a guarantee to save 25 per cent. in fuel over the present heating systems under steam boilers. The test in some cases, the company say, showed a saving in coal of 50 per cent.

Westinghouse, Church, Kerr & Co., New York, continue to receive numerous export orders for power apparatus, a recent sale of note being two Westinghouse three-cylinder vertical producer gas engines, belted to generators, for a 125 horse-power light and heat plant at Tripolis, Greece. The fuel to be used will be native lignite, and the engines will be supplied with fuel gas from Taylor producers, furnished by R. D. Wood & Co. of Philadelphia. Other sales include an electrical supply company of Lima, Peru, 330 horse-power Westinghouse compound engine; Negociacion Minera de Promontorio, Durango, Mexico, 200 horse-power engine type generating outfit; S. Pearson & Son, Limited, Salina Cruz, Mexico, 200 horse-power engine type and a number of standard engine generating outfits; Mexican National Iron & Steel Company, Durango, Mexico, 45 horse-power compound engine; Michaelis Hallenstein & Co., Victoria, Australia, 150 horse-power Westinghouse compound engine. Two 1000-kw. Westinghouse steam turbine generating units for the De Beers mines at Kimberly, South Africa, have recently been shipped. These are said to be the largest steam turbines ever exported from this country.

The Allis-Chalmers Company, Chicago and Milwaukee, report the following partial list of sales of engines for the month of March, 1903: Tremont & Suffolk Mills, Boston, Mass., 21 and 48 x 48 1890 cross compound Reynolds Corliss engine; Carnegie Steel Company, Pittsburgh, Pa., 42 and 66 x 60 tandem rolling

mill engine; Lenoir Cotton Mills, Lenoir, N. C., one 28 x 42 low pressure side; Woodward Iron Company, Woodward, Ala., three 44 and 84 x 60 vertical long crosshead blowing engines; South Side Elevated Railway Company, Chicago, Ill., 34 and 70 x 54 1890 horizontal cross compound Reynolds Corliss engine; Washburn-Crosby Company, Minneapolis, Minn., one 26 and 58 x 60 1890 cross compound condensing Reynolds Corliss engine; Illinois Steel Company, Chicago, Ill., two 46 and 86 x 84 and 84 x 60 vertical steeple cross compound blowing engines; International Traction Company of New Jersey, Jersey City, N. J., two 34 and 68 x 48 1890 cross compound condensing Reynolds Corliss engines; Hunter Milling Company, Wellington, Kan., one 12 x 42 jet condenser; Pennsylvania Railroad Company, Philadelphia, Pa., cross compound Reidler air compressor, 15 and 24 x 36; Wild Goose Mining & Trading Company, Alaska, spare parts for Reidler pumping engine; Charles Butters & Co., Limited, Mexico, one 14 x 42 1890 frame Reynolds Corliss engine and two horizontal tubular boilers, E. C., 66 inches by 16 feet; two 18 x 36, one 26 x 48, 18 x 48 and 16 x 36 1890 frame Reynolds Corliss engines; two 12 x 36, one 16 x 42, 20 x 42 and 10 x 30 girder frame Reynolds Corliss engines.

The Manewal Lange Biscuit Company, St. Louis, Mo., will be in the market about April 25 for an engine, boiler, dynamos and cracker machinery for their new brick and stone plant. J. L. Wees, architect, may be addressed.

The Rollins Engine Company of Nashua, N. H., are very busy. Among recent orders are: A 350 horse-power cross compound engine, American Tool & Machine Company, Boston, Mass.; 150 horse-power engine, Mix & Riddell Hardware Company, Stamford, Conn.; 150 horse-power engine, Burns, Silver & Co., Bridgeport, Conn.; 75 horse-power engine, L. M. Reynolds & Co., Brockton, Mass.; 125 horse-power engine, P. & F. Corbin Company, New Britain, Conn.; 175 horse-power engine, Rice & Hutchins, New Braintree, Mass.; 125 horse-power engine, Willis I. Shaw, New Limerick, Maine; 300 horse-power engine, Miller's Falls, Mass., Paper Company; 150 horse-power engine, Cape Ann Tool Company, Pigeon Cove, Mass.; 250 horse-power engine, Abbott Worsted Company, Grantville, Mass.; 300 horse-power engine, Atwood & McManus, Chelsea, Mass.; 250 horse-power engine, Louis A. Cossett, North Abington, Mass.; 250 horse-power engine, Atwood Bros., Whitman, Mass. The engine for P. & F. Corbin Company is the eleventh which the Rollins Company have built for that company.

Foundries.

Completed plans for the additions to the Ætna Foundry & Machine Company's plant, at Springfield, Ill., call for a machine shop, 120 x 140 feet, and an office building, 21 x 40 feet and two stories high. The office building is to be of brick construction with stone trimmings. The first floor will be used for the offices of the foundry and the second floor for drawing and plan rooms. The machine shop is to be provided with a 10-ton traveling crane. S. A. Bullard is the architect.

The Pratt & Cady Company of Hartford, Conn., have received the contract for nearly 700 hydrants for the grounds of the St. Louis Exposition. The hydrant will be of a new design and will possess exceptional features, it is claimed.

The soil pipe department of the Beggs Pipe & Foundry Company, Birmingham, Ala., has been taken over by the Southern Pipe & Foundry Company, recently incorporated with a capital stock of 35,000. The plant is new and additional machinery has been installed, bringing the capacity up to 30 tons of finished product daily. The output will be soil pipe and fittings exclusively. The equipment was furnished by the Milner & Keating Company and other Birmingham dealers.

The Dimmick Pipe Company, Birmingham, Ala., report that business so far this year is in excess of that of 1902, which was the best in their history. Their pipe business now extends from water works in places in the Atlantic States to others in the Pacific States. Pressure of domestic orders has caused the company to pay little attention to the foreign field. About a year ago they added a department for the manufacture of hydrants, valves and architectural castings, which has been kept going to its full capacity.

The Anderson Chilled Plow Company, South Bend, Ind., whose plant was recently destroyed by fire, will rebuild on the same site. The new plant will be larger than the old and will be fire proof throughout. There will be a main building, 80 x 420 feet, which will contain the offices, pattern room and foundry, grinding room, paint shop and power house.

The Pittsburgh Brass Foundry Company, recently organized in Pittsburgh, will build a brass foundry in that city.

Patrick McManus, formerly with the American Steel Foundry Company of Sharon, Pa., with some capitalists of New Castle, Pa., propose to start a new plant for the manufacture of steel castings. The new company will have a capital of $300,000, the majority of the stockholders being residents of New Castle and Sharon.

The Albin foundry, which was moved from Mercer to Grove City, Pa., about a year ago, has become a great addition to the manufacturing side of Grove City. One hundred men are employed, the product being principally wheels for mine cars.

The United States Cast Iron Pipe & Foundry Company are making a number of improvements and additions to equipment at their Scottdale works, at Scottdale, Pa., that will permit the casting of pipe up to 60 inches in diameter. The additional equipment, in connection with the pit, will be a 10-ton electric core carrier for handling the heavy cores, while the present carrier will be used for lighter cores. The core ovens, that have been in use since the plant was built, will be entirely torn away and built outside the present building to increase the amount of working space inside. The smaller of the two cupolas will be torn away and a new one constructed, which will give them two cupolas, each with a capacity of 150 tons of iron per day. A large hydraulic press for testing pipes will be needed, and to accommodate this with the necessary pumps and attachments will require a new testing house. The new house will be erected on the site of the present test house and will be a two-story building.

The Great Falls Iron Works, founders and machinists, Great Falls, Mont., are building an addition to their foundry, 42 feet square, together with molding pits and core ovens, for the manufacture of cast iron pipe, having been awarded a contract for about 20,000 feet of 6 and 8 inch pipe by the city of Great Falls. A 4-ton electric jib crane will be installed to serve this department.

The Wulbern Machine & Foundry Company, Birmingham, Ala., are putting a new mining car wheel on the market for which application for a patent has been made. Its special features are said to be its oil and labor saving qualities, with a minimum of friction on journals.

The Penn Engineering & Foundry Company of Pittsburgh have applied for a charter with a capital of $250,000. The company propose to erect and operate a malleable and gray iron and brass foundry and machine shop in the Pittsburgh district.

The Norwalk & Western Railway are planning to erect a large foundry at East Portsmouth, Ohio, in connection with their shops now being erected in that city.

The Mansfield Engineering Works of Mansfield, Ohio, are making important improvements to their plant. They are erecting a new foundry building, 75 x 175 feet, with a leanto which will make the structure nearly 100 feet wide. The foundry will be equipped with a 25-ton crane and will be supplied with a cupola and air furnace. The foundry will be completed about June 1, and it is the intention to produce castings of the largest size, for which they already have a number of orders to fill. They contemplate other improvements at a later date.

The Marine Engine & Machine Company, New York, contemplate the erection of a large addition to their foundry at Harrison, N. J.

Bridges and Buildings.

The Winamac Bridge Company, Winamac, Ind., have leased the building vacated by the Great Western Canning Company and will increase the capacity of their plant.

The Norcross Bros. Company of Worcester, Mass., have been awarded the contract for the new Empire Theatre, New York City; for house and stables for Mr. Plant, to be built at Groton, Conn., to cost $360,000, and for the new six-story Mason Building, to be erected at Providence, R. I., at a cost of about $150,000.

The Smith Mfg. Company of Waynesboro, Pa., at a meeting of the directors on Thursday, April 16, decided to make an assignment of all their property for the benefit of their creditors. W. T. Omwake and B. F. Crouse, both of Waynesboro, were made assignees. The liabilities are $22,000, and enough will be realized to meet all debts, it is thought. The Smith Mfg. Company were formed in February, 1890, with a capital stock of $40,000, $32,000 of which was paid in. They succeded the Smith Company, which manufactured iron fences, steel jail cells and other structural work. All orders now on hand will be completed, but no new work undertaken. The property will be sold.

Fires.

A large amount of oil well machinery, including engines, pumping rigs, derricks, pipe line equipment, &c., in the Texas oil fields, was destroyed by fire April 15. The fire started on Spindle Top, near Beaumont, and resulted in the loss of property valued at $1,000,000. Fifty or more wells probably are ruined by the dropping of tubing into them as a result of the fire. Among the losers are London Oil & Pipe Line Company, Caldwell Oil Company, Spindle Top Power Company, Central Power & Equipment Company, Pumping Station Dividend Oil Company, Detroit-Beaumont Company, Palestine-Beaumont Company, Sun Company, Advance Oil Company, Queen City Company, Queen of Waco Company, Drummore Company, Alamo Company, Buck Eye Company, Ground Floor Company, Manhattan Company, Borealis Company and Buffalo Company.

The erecting and machine shops of the Baltimore & Ohio Railroad Company, at Glenwood, Pa., were damaged $50,000 by fire April 16.

The Newfield Brick Works, near Ithaca, N. Y., were demolished by a land slide April 13. The loss is estimated at $40,000.

The terminal equipment plant of the Canadian Pacific Railroad, at Sand Point, N. B., was damaged $50,000 by fire April 17.

The plant of the Preston Leather Mfg. Company, Newark, N. J., was partly destroyed by fire April 19, entailing a loss of about $30,000.

The machine, blacksmith and carpenter shops of the Lehigh & Wilkes-Barre Coal Company, Wilkes-Barre, Pa., were destroyed by fire April 18. The loss is placed at $30,000.

The large packing plant of the Pacific Meat Company, Tacoma, Wash., was destroyed by fire April 20. The loss will reach $200,000.

The machine shops and roundhouse of the Shreveport & Red River Valley Railroad, at Shreveport, La., were destroyed by fire April 20. The loss is put at $50,000.

Iron and Industrial Stocks.

Some interesting developments affecting the stocks of a number of companies occurred during the past week. Owing to differences among stockholders of the Chicago Pneumatic Tool Company, which resulted in the passing of the usual quarterly dividend, the price of that stock at Chicago declined to 35. This was a heavy drop from the price recently ruling and presents a marked contrast to the high prices of last year, the maximum attained having been 128½. It is stated that the company are doing a very profitable business and earning considerably more than the dividend requirement, but report has it that leading interests in the company insist that stock given to certain parties for purposes of promotion shall be returned to the company before any further dividends are declared. The stock recovered part of the decline, selling up to 50. At Philadelphia the stock of the Cramps Shipbuilding & Engine Company broke from 54 to 37¼, on rumors that a hitch had occurred in the bond issue, although this was denied. Quite a number of stocks advanced. American Can moved up sharply on reports that a dividend would be declared at an early day on the preferred stock. Under heavy transactions the price of the preferred advanced to a maximum of 50¾ and the common to 9¼. American Steel Foundries stocks also advanced on the excellent statement of earnings recently made. The common sold up to 17¼ from 14¼. Advances were quite general throughout remainder of the list, American Locomotive common selling up to 28¼, against 26½ last week; Colorado Fuel & Iron, common, 65½, against 56½; Empire, common, 14½, against 13, and preferred, 50, against 47; Pressed Steel, preferred, 94, against 93; Republic, 20 against 19 on the common and 79 against 77¼ on the preferred; Sloss-Sheffield, common, 62 against 55; Tennessee, 66⅛ against 64; Steel, common, 36⅛ against 34⅞; Steel, preferred, 87⅛ against 85; Virginia, common, 33½ against 32½; Dominion, 27⅞ against 26½. United States Steel new 5 per cent. bonds advanced to 86¼ against 84¾.

Pressed Steel Car Company.—The earnings for the quarter ended March 31 are as follows:

	1903.	1902.	Increase.
Net earnings	$1,069,330	$1,025,118	$44,212
Fixed charges	48,191	59,842	*11,651
Net income	$1,021,139	$965,276	$55,863
Prop. preferred dividend	218,750	218,750	.....
Balance	$802,389	$746,526	$55,863
Depreciation reserve	77,500	67,007	10,493
Surplus	$724,889	$679,519	$45,370

* Decrease.

The first mortgage of the Lackawanna Steel Company securing $20,000,000 of convertible bonds (present issue $15,000,000) has been filed to the Farmers' Loan & Trust Company of New York as trustee. The authorized issue of capital stock has been increased from $40,000,000 to $60,000,000, to provide for the convertible feature of the aforesaid bonds. The outstanding stock is $35,000,000, of which $20,000,000 is full paid; the remainder, $15,000,000, is 60 per cent. paid, the balance due being subject to call in two installments of 20 per cent. each, on 60 days' notice.

Stockholders of the Union Switch & Signal Company of Pittsburgh will hold a special meeting on June 16 to consider the question of an increase in the capitalization. The directors have decided on an increase of $1,000,000 common stock, which will make the entire capital $2,500,000, of which $500,000 is preferred stock. While details of the proposed increase will be left to the decision of the stockholders, it is probable that only $500,000 of the new stock will be issued and $500,000 retained in the treasury.

The Standard Steel Car Company of Pittsburgh, with works at Butler, Pa., will hold a meeting this week to vote on the question of issuing $2,000,000 in bonds. The works are crowded, and the proposed issue of bonds is to provide additional working capital. The Standard Steel Car Company recently received an order from the Chicago, Burlington & Quincy Railroad for 2000 steel cars.

Dividends.—Allis-Chalmers Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable May 1. Books close April 25 and reopen May 2.

One Clairton Furnace Started.

(By Telegraph.)

PITTSBURGH, PA., April 22, 1903.—The Clairton Steel Company, with offices in the Frick Building, Pittsburgh, and blast furnaces and open hearth works at Clairton, Pa., have started up No. 1 blast furnace. This stack is 85 feet high, 21 feet in diameter at the bosh, and is equipped with four Massicks & Crookes hot blast stoves. There are seven Southwark blowing engines, giving two for each furnace, and a spare engine. For the first time in the history of blast furnace practice in the United States this stack was blown in with 100 per cent. of Mesaba ore and started off very successfully. W. P. Snyder, president of the Clairton Steel Company, had the three furnaces at Clairton erected with a view of using 90 to 100 per cent. of Mesaba ore. This has been the practice for several years at the Shenango furnaces of the Shenango Furnace Company at Sharpsville, Pa., Mr. Snyder being president of this concern. There was some doubt expressed as to whether a large furnace such as Clairton No. 1 could be run on 100 per cent. of Mesaba ore, but the fact that this new furnace was blown in on this percentage of Mesaba and very successfully would seem to demonstrate that this high percentage can be used successfully. The experiment of blowing in a stack on Mesaba ore exclusively has been awaited with a good deal of interest, and it would seem has demonstrated that it can be successfully done.

This stack is expected to make from 500 to 550 tons of iron per day. No. 2 stack is almost completed and will be blown in early in May, and No. 3 will be started in June. All of the iron made in the three furnaces will be used in the open hearth furnaces of the Clairton Steel Company. The furnaces are also equipped with two casting machines built by the American Casting Machine Company of Pittsburgh.

Some excellent records for steel production are being made in the blooming mill of the Clairton works. This is a 40-inch mill and in one day recently turned out 944 tons of billets 4 inches in size and larger. The mill has been doing jobbing work and on this account the excellent records for production are all the more remarkable.

George Collord, formerly assistant superintendent of the Chenango furnaces, is superintendent of the Clairton blast furnaces.

The manufacturers of Vermont, according to a press dispatch from Burlington, are to meet in Rutland on April 30 for the purpose of forming an organization to be known as the Employers' Association of Vermont for mutual protection against the demands of union labor. The labor troubles in the cities and larger towns throughout the State have reached large proportions during the past few months. Among the objects of the association as set forth in the prospective constitution are the investigation and adjustment of any question arising between employers and employees when such question shall be submitted to the association; to endeavor to make it possible for any person to obtain employment without being obliged to join a labor organization and to encourage all such persons in their efforts to resist the compulsory methods of organized labor; to protect themselves in such manner as may be deemed expedient and proper against legislative, municipal and other political encroachments.

H. J. Elson, formerly assistant treasurer of Walter A. Zelnicker Supply Company in St. Louis, has been elected treasurer, Louis Alsberg having resigned on account of ill health. H. J. Elson is a brother of Ed. Elson, vice-president of this company and also manager of the New Orleans office, H. J. Elson having been an ensign in the United States Navy until last September, when he resigned.

J. Mitchell Clark of Naylor & Co., New York, sails for Europe next Tuesday.

The Iron and Metal Trades.

Generally speaking, and taking the country as a whole, the markets for Foundry Pig Iron have been quiet. A certain tonnage is being placed for early and prompt delivery, and cases of actual scarcity are not unknown. But little is being done for the second half, although the foundries are known to have made considerable contracts for castings for the third quarter, for which they have not covered as yet.

German furnace interests meet fresh inquiries either with indifference or refuse to quote for early delivery. English sellers seem more eager, and as illustrating the position we may note that Middlesbrough Pig is being offered as low as 56 shillings 6 pence, c.i.f., in cargo lots, which would make the cost to import duty paid a shade over $17.75.

Basic Pig has been offered at prices equivalent to $17, Birmingham, or $18, Virginia furnaces, without leading to business. Bessemer Pig is being offered in Pittsburgh as low as $19.50 at Valley furnace, for the second half.

Another period of scarcity has developed in the Steel market, due primarily to the enormous demand for finished goods. The Wire trade particularly is under enormous pressure, and while jobbers have been pretty well taken care of themselves, the manufacturing industries which purchase Drawn Wire are complaining a good deal of delays in deliveries. The demand for Steel is so urgent that one of the large Rail mills in the Central West has been switched over to Billets. On the other hand, a modern mill in the Youngstown district is to close down for two months before long. In the East some additional Steel capacity has become available recently, but the requirements seem so large that further importations are necessary. German Billets are difficult to secure for early delivery, the majority of the works being filled up for some time to come. Recent prices are 85 shillings, shipping port, and some business has been done. Importers note that the demand is not only from tidewater markets, but that inquiries are being received from the West also.

Wire Rods are very scarce and are firmly held at $37, Pittsburgh. Foreign Rods cost £6, c.i.f., which with duty added is equivalent to about $38.25. Only a moderate business is being done.

The Structural and Plate trades are securing good orders from car builders, whose requirements are enormons. Some round lots of Structural Material and Plates have also come to the mills from other sources.

The Sheet market is very strong, and there is an upward tendency which it is believed may soon crystallize into an announcement of an advance in official prices.

The volume of business in Merchant Pipe is not as heavy as it has been, but the mills are loaded down with work and some good orders for Line Pipe are in sight.

Reports regarding the Bar trade are not uniformly favorable. In Steel Bars the enormous capacity of the modern continuous mills is a telling factor in the situation.

Coke is growing more plentiful and there is some reselling, so that the day of the fancy prices is over.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous,

	Apr. 22, 1903.	Apr. 15, 1903.	Mar. 25, 1903.	Apr. 23, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$21.25*	$21.00	$22.25	$19.75
Foundry Pig No. 2, Southern, Cincinnati	*20.25*	20.25	21.25	....
Foundry Pig No. 2, Local, Chicago	**22.80**	22.00	22.50	19.00
Bessemer Pig, Pittsburgh	*20.85*	21.50	21.85	19.75
Gray Forge, Pittsburgh	*20.25*	20.25	21.00	19.00
Lake Superior Charcoal, Chicago	*25.00*	25.00	26.50	21.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*30.50*	....	31.00	31.00
Steel Billets, Philadelphia	***29.50**	*28.50	*29.00	33.00
Steel Billets, Chicago	31.25	....	31.50	....
Wire Rods, Pittsburgh	37.00	37.00	37.00	36.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	18.50	18.50	18.50	17.50
O. Steel Rails, Philadelphia	21.50	21.50	21.25	....
O. Iron Rails, Chicago	**24.50**	24.50	24.00	24.00
O. Iron Rails, Philadelphia	**25.00**	25.00	24.50	26.00
O. Car Wheels, Chicago	24.00	24.00	24.00	19.75
O. Car Wheels, Philadelphia	*24.00*	24.00	24.50	17.75
Heavy Steel Scrap, Pittsburgh	21.50	21.50	21.50	....
Heavy Steel Scrap, Chicago	18.50	18.25	18.25	16.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.93½	1.93½	1.93½	1.92
Common Iron Bars, Chicago	1.80	1.85	1.80	1.90
Common Iron Bars, Pittsburgh	1.85	1.85	1.89¾	...
Steel Bars, Tidewater	1.75	1.75	1.75	1.80
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	1.85	1.85	1.85	1.85
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.73½	1.73½	1.75	1.95
Beams, Pittsburgh	1.60	1.60	1.60	1.70
Angles, Tidewater	1.73½	1.73½	1.75	1.85
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Shelp, Grooved Iron, Pittsburgh	*2.00*	2.00	2.05	2.10
Skelp, Sheared Iron, Pittsburgh	*2.05*	2.05	2.10	2.20
Sheets, No. 27, Pittsburgh	2.65	2.65	2.65	3.00
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	**2.15**	2.15	2.10	2.00
METALS:				
Copper, New York	**15.00**	15.00	14.50	11.75
Spelter, St. Louis	**5.40**	5.40	5.25	4.15
Lead, New York	4.65	4.65	4.65	4.10
Lead, St. Louis	4.57½	4.57½	4.57½	4.00
Tin, New York	**29.50**	29.65	29.25	27.25
Antimony, Hallett, New York	7.00	7.00	7.00	8.00
Nickel, New York	40.00	40.00	40.00	50.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

* Foreign.

Chicago.

FISHER BUILDING, April 22, 1903.—(*By Telegraph.*)

The most interesting as well as the most significant fact in the Iron and Steel situation at the moment is the extraordinary demand for Billets and the great scarcity of the domestic product, while foreign Steel is unavailable before September or October of this year. The tonnage of Finished Material on the books of the United States Steel Corporation is said to be greater than at any previous time since the organization of the company, and the demand for Bars and Billets from the constituent mills is extraordinary. So active and so urgent are the necessities that the Youngstown mill, which has been turning out upward of 42,000 tons of Rails per month, has been transferred to the rolling of Bars and Billets, notwithstanding the heavy orders and the continued active demand for Rails. Independent concerns are also hard presed for Billets, with the supply inadequate apparently, although some few sales of both Bessemer and Open Hearth Steel have been noted during the week. Some Wire Rods, too, have been sold at very high prices for delivery during the next three months. Agricultural implement manufacturers are gradually coming into the market for a portion of their requirements, several important contracts for both Bars and Agricultural Shapes being reported for the 1903-1904 season. In Structural Material the demand to cover contracts for railroad cars is the most prominent feature at the moment, although some very heavy tonnage, as previously noted, is pending for large office, store and factory buildings throughout the country. Rail mills continue to accept orders for Rails for late delivery, and although individual transactions are not large, the aggregate tonnage is considerable. New business in Plates is

not large, but there is some tonnage being placed to cover construction of cars. Sheets, both Black and Galvanized, are hardening in tone with good consumptive trade and a disposition to advance prices from local stocks. An interesting feature of the week has been the sale of some large Ingots and Blooms to Cincinnati manufacturers of machinery for forgings. One Ingot weighing 40,000 lbs. and two weighing 36,000 lbs., one Bloom weighing 20,000 lbs. and one weighing 18,000 lbs. have been placed during the week. Reports just received from personal investigations of 15 furnaces in the South indicate that the yards of such are bare of stock and furnaces behind on shipment of orders taken at $17 to a considerable extent. These facts, combined with labor trouble in the Coal fields, which may affect Coke, have imparted a slightly firmer tone to the market for Pig Iron at the close.

Pig Iron.—There has been some little increase in the buying of Iron of nearly all grades for the remainder of the first half of the year, and in a number of instances deliveries extend over into the third quarter. There is no large buying, however, and both mills and foundries seem to be indifferent about covering their requirements for the second half of the year. While contracts for castings in a number of instances have been taken for the third quarter, there are quite a number of founders who have not closed their contracts for the second half, and therefore are not disposed to anticipate purchases of Pig Iron. The whole trend of events seems to be in favor of the buyer, and even where contracts for castings have been taken buyers are disposed to temporize, believing that nothing is to be gained by quick purchases. However, the associated Southern furnaces have not changed their attitude in regard to prices, but there are rumors that some individual members have refused to be bound by the general agreement and have operated upon this basis. It is evident that independent furnaces are not only accepting $17, Birmingham, basis for quick delivery, but for desirable contracts of several thousand tons would accept $16.50, Birmingham, for the last half of the year, and at the close one or two lots are said to have been closed on this basis. In the aggregate about 4000 tons of Southern No. 2 Foundry have been sold in lots of 100 to 500 tons at $21.35, Chicago, shipments to begin in May, extending over into July. Spot sales of single car lots have also been made at the same price. Two hundred and fifty tons of Southern No. 1 Soft have sold at $21.50, and 250 tons of No. 2 Soft at $21, Chicago, for similar deliveries, and negotiations are now pending on 6000 tons of Nos. 2, 3 and 4 Foundry. Bessemer Iron has also continued to reflect an easier feeling, with offerings of Malleable at $21.50 to $22, Chicago, and sales of 500 tons of Standard at $21.85, Chicago, for early delivery. There have been quite a number of sales of Southern Silvery and a number of carload lots of Northern High Silicon Iron on the basis of quotations, all for quick shipment. A better demand has been experienced for Car Wheel Iron, with sales of 1000 tons of Southern Car Wheel at $25 at the furnace and 100 tons of the same Iron at $26 at the furnace, the larger sale for long delivery. Northern Charcoal Iron is also in better demand, with one transaction of 700 tons on the basis of quotations for shipment during the next six months. Basic Iron is said to be offered at $17, Birmingham, or $18, Virginia furnaces, but the large buyers in the market some weeks since are holding off, although the market has now reached the basis upon which they would have closed for 40,000 tons three weeks ago. The following are the prices current, f.o.b. cars, Chicago, the inside quotations more nearly representing the trading basis for the last half of the year:

Lake Superior Charcoal	$25.00 to $26.00
Local Coke Foundry, No. 1	23.30 to 23.80
Local Coke Foundry, No. 2	22.80 to 23.30
Local Coke Foundry, No. 3	21.50 to 22.00
Local Scotch, No. 1	23.00 to 23.50
Ohio Strong Softeners, No. 1	25.80 to 26.80
Southern Silvery, according to Silicon	23.35 to 25.35
Southern Coke, No. 1	21.50 to 22.00
Southern Coke, No. 2	20.85 to 21.35
Southern Coke, No. 3	20.35 to 20.85
Southern Coke, No. 1 Soft	21.50 to 22.00
Southern Coke, No. 2 Soft	20.85 to 21.35
Foundry Forge	19.85 to 20.35
Southern Gray Forge	19.35 to 19.85
Southern Mottled	19.35 to 19.85
Southern Charcoal Softeners, according to Silicon	25.85 to 27.85
Alabama and Georgia Car Wheel	29.35 to 30.35
Malleable Bessemer	21.50 to 22.00
Standard Bessemer	21.85 to 22.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	30.30 to 31.30

Bars.—Some little improvement has been experienced in the demand for Steel Bars, several contracts having been placed by agricultural implement manufacturers for a portion of their 1903-1904 requirements, aggregating between 5000 and 6000 tons. There has also been more specifying on contracts previously placed. Bar Iron has been quiet, the only important sales being for car material, several thousand tons having been sold for early shipment. There has also been some inquiry for later delivery, the bulk of the sales to be made at 1.85c., but the whole range is from 1.80c. to 1.90c., Chicago. The following are the prices current, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.80c. to 1.90c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.16½c. to 2.26½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. There has been a fair merchant trade and a steady market, prices being as follows: Bar Iron, 2.15c.; Soft Steel Bars, 2c. to 2.25c.; Angles, 2.25c., and Hoops, 2.40c., base, from store.

Structural Material.—The feature of the week has been the placing of orders for 8000 tons of Channels, Beams and Angles, to cover contracts taken for railroad cars. Some tonnage has also been closed for railroad bridges, and about 2000 tons in lots of 100 to 500 tons have been sold for factories and office buildings in this section. The large contracts referred to a week ago, aggregating 48,000 tons, are still pending, with the prospect of being placed early in May. The market remains firm in tone, without change in prices, which are as follows at Chicago for mill shipment: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. There has been a good demand for shipment from local stocks and the market has remained steady, without change in prices, which are as follows: Beams and Channels, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

Plates.—No large orders have been placed during the week, but about 2000 tons will be required for cars for the Chicago, Lake Shore & Eastern Railroad, which is owned by the Illinois Steel Company. An extremely strong tone continues to characterize the market, the question of deliveries—not orders—being the serious one, and in not a few instances premiums of $1 to $3 per ton are obtained by independent mills for quick shipment. Prices remain unchanged, as follows, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.10c.; Marine, 1.95c. to 2.10c. There is an active demand for shipments of small orders from stock and full prices are readily obtained, as follows: Tank Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16 inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.: Flange Steel, 2.40c. to 2.50c., all f.o.b. warehouse, Chicago.

Sheets.—There has been quite an active demand for both Black and Galvanized Sheets, and the tone of the market is hardening, with the tendency of prices upward, but no actual advance has been announced either by the largest or independent interests. The following are the prices for Black Sheets, carload lots, f.o.b. Chicago, mill shipment: No. 10, 2.12½c. to 2.16½c.; No. 12, 2.22½c. to 2.26½c.; No. 14, 2.32½c. to 2.36½c.; No. 16, 2.42½c. to 2.46½c.; Nos. 18 and 20, 2.56½c. to 2.60½c.; Nos. 22 and 24, 2.66½c. to 2.70½c.; No. 26, 2.76½c. to 2.80½c.; No. 27, 2.86½c. to 2.90½c.; No. 28, 2.96½c. to 3.00½c. Small lots from store sell at 10c. to 15c. above mill prices. Galvanized Sheets continue to sell at 75 and 5, Chicago, for mill shipment, prices being more generally maintained and sales from store made on the basis of 75 and 2½ to 75 discount.

Cast Pipe.—The market is somewhat easier in tone, in sympathy with Pig Iron, and quotations for round lots are from 50c. to $1 per ton lower, but for small quantities the quotations are maintained. No large contracts have been placed during the week, but the Louisville Water Company have closed a contract for three years' requirements, which it is estimated will be about 2500 tons, mainly for the smaller sizes. There have also been two sales of 500 tons each of Culvert Pipe and 1600 tons of 36's placed by the city of Chicago. At Kansas City all bids were refused. The city of Minneapolis will place its contract on the 24th inst. Manufacturers sell at the following prices, f.o.b. cars, Chicago, the outside prices being for small lots: Four-inch, $33 to $34; 6-inch, $32 to $33; 8-inch, $31.50 to $32, and larger, $31 to $31.50, for Water, and $1 per ton higher for Gas Pipe.

Billets.—There is still a great scarcity of domestic Billets, with an active demand, and sales of about 1000 tons of Bessemer at $31.25 for early shipment, and several thousand tons High Carbon Open Hearth Forging Billets at $33 for extended delivery. Sales of Forging Billets have been made in a jobbing way at $34 to $38, according to analysis, buyer and time of delivery. There is an inquiry for 5000 tons of German Billets for June-July delivery, but agents find it impossible to contract for deliveries earlier than October. Prices remain nominal at $31.50, delivered, Chicago. About 400 tons of Wire Rods sold at $37.50, Chicago, for April, May and June delivery.

Merchant Pipe.—New contracts for Merchant Pipe have fallen off somewhat, but the mills are overcrowded, and this relief is desirable rather than otherwise. The tone of the market continues strong, but prices are unchanged. The jobbing trade has continued on a liberal scale, and full prices have been realized. The following is the official schedule of discounts for carload lots, Chicago, base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron.	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—There has been a fair volume of business, but as a rule nearly all the large jobbers have covered requirements for some time. The market remains firm in tone and prices unchanged at the following schedule of discounts for carload lots, mill shipment, Chicago:

	Steel.	Iron.
1 to 1½ inches	43.35	38.35
1¾ to 2½ inches	55.85	35.85
2¾ to 5 inches	60.85	45.85
6 inches and larger	55.85	35.85

Less than carloads, 12½ per cent. advance.

There is a fair current order trade for shipments from local stocks and the market continues firm. The following are the discounts prevailing for shipment from local stocks:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	..

Merchant Steel.—The demand for agricultural Steel has continued liberal, two additional contracts, one valued at about $30,000, having been closed for the requirements of the season of 1903-1904. There has also been a good demand for quick shipment. One or two contracts for 100 tons each have been placed during the week. There has been a fair inquiry for Tool Steel, without essential change in prices. Manufacturers of Cold Rolled Shafting have reaffirmed the previous basis. The following are the prices current at Chicago for mill shipment; Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—The demand has continued active for both Standard and Light Sections, sales aggregating about 20,000 tons, some of the business being taken for Eastern mills. It is significant that, notwithstanding the mills are so heavily oversold, because of the urgent call for Billets and Bars by constituent companies of the United States Steel Corporation, one of the Eastern mills which has been rolling Rails at the rate of 42,000 tons per month will be put on Billets and Bars to relieve the strain. There has been an increased demand for small lots of Light Rails from both first and second hands. Official prices have remained strong at $28 for standard and $27 for second quality, mill shipment. Light Rails have been selling at $34 to $40, according to weight. Track Supplies have continued in good demand and firm at the following prices, Chicago, for mill shipment: Splice or Angle Bars, 2c. to 2.25c.; Spikes, 2.10c. to 2.25c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 3c.; with Hexagon Nuts, 3c. to 3.25c. From store 10c. to 15c. over mill prices are asked and obtained.

Old Material.—One large local dealer handling Scrap in this market has retired from business, and the Iron which previously has found an outlet through this company is being distributed to other local dealers, which gives the impression of large offerings, and although substantially no more Iron than usual is being offered, a little easier feeling has developed, especially as the mills are buying less freely. However, prices are well sustained, as previously quoted, and Heavy Steel Melting Scrap is firmer. There have been some orders of moment placed for Dealers' Forge, Turnings and Borings and Heavy Cast Scrap during the week on the basis of prices quoted below. The offerings from the railroads are about the average and prices are steady. The following are the prices per gross ton, Chicago:

Old Iron Rails	$24.50 to $24.75
Old Steel Rails, mixed lengths	18.50 to 19.00
Old Steel Rails, long lengths	22.00 to 22.25
Heavy Relaying Rails	31.50 to 32.00
Old Car Wheels	24.00 to 24.50
Heavy Melting Steel Scrap	.... to 18.50
Mixed Steel	16.00 to 16.50

The following quotations are per net ton:

Iron Fish Plates	$21.50 to $22.00
Iron Car Axles	24.50 to 25.00
Steel Car Axles	23.50 to 24.00
No. 1 Railroad Wrought	20.50 to 21.00
No. 2 Railroad Wrought	18.25 to 18.75
Shafting	20.00 to 21.00
No. 1 Dealers' Forge	16.50 to 17.00
No. 1 Busheling and Wrought Pipe	14.00 to 14.50
Iron Axle Turnings	14.50 to 15.00
Soft Steel Axle Turnings	14.50 to 14.75
Machine Shop Turnings	14.25 to 14.75
Cast Borings	10.00 to 10.25
Mixed Borings, &c	10.50 to 11.50
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	17.50 to 18.00
Stove Plate and Light Cast Scrap	13.50 to 14.00
Railroad Malleable	16.50 to 17.00
Agricultural Malleable	15.50 to 16.00

Metals.—A firmer tone has been developed for Copper, with higher prices demanded by local dealers, but there is very little business of any character offering. Lake is held at 14¾c. in carload lots and 15c. in a jobbing way. Pig Lead has not departed from its nominal state as far as this market is concerned, and official prices remain at 4.60c. in 50 to 100 ton lots and 4.62½c. to 4.65c. in carload lots. Spelter has sold readily and the market has continued firm on the basis of 5.40c. in carload lots for Slabs. Sheet Zinc has remained quiet at 6¾c., Chicago. Old Metals have been a little firmer in tone, with some little improvement in the demand, but without change in prices. Heavy Cut Copper is selling at 12½c., Red Brass at 12½c., Copper Bottoms at 11¼c., Lead Pipe at 4.35c. and Zinc at 4.25c., spot.

Coke.—The market is well supplied with spot stock, and with only a moderate demand an easy tone continues to prevail. Virginia Furnace Coke is quotable at $6.50 to $7 and Connellsville at $7 to $7.50, spot track, Chicago, single cars of Foundry Coke selling at 50c. above these prices. Some Pocahontas Coke, which is claimed to be high in sulphur, is available at $5.50 to $6.50 on track, Chicago.

Theodore Geissmann, a mill representative dealing in Iron and steel Structural Material, has taken offices at 40 Dearborn street, Chicago, having moved from the Monadnock Building during the past week.

The Field-Evans Iron Company, Chicago and Cincinnati, is a co-operative company, and has been organized by consolidating the interests formerly represented by David Evans, Chicago; Robert Field, Cincinnati, and the stock of the Field-Croxton Iron Company. The new company are the exclusive selling agents for the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala.; Williamson Iron Company, Birmingham, Ala., and La Follette Coal, Iron & Railway Company, La Follette, Tenn. The company also have Coke accounts in the Connellsville and West Virginia districts. Offices will be continued at the following points: Chicago, Monadnock Block, Irvin McDowell, manager; St. Louis, Commonwealth Trust Building, E. C. Smith, manager; Cleveland, Ohio, Wm. Wieman, vice-president. The general offices are located at Cincinnati, in charge of Robert Field, vice-president and general manager.

Philadelphia.

FORREST BUILDING, April 21, 1903.

The market is still in a somewhat uncertain condition, although the general impression is that prices will be maintained until midsummer, if not beyond that time. There is so little Iron at furnaces or in the yards, and the demand is so good, that there is hardly a chance for more than enough to go around until the date named. After that time, if the crops have turned out well, and no unforeseen obstructions have been met with, the chances will be good for steady prices during the remainder of the year. At present the feeling is extremely cautious, and while there is no serious apprehension of unfavorable developments, there is a general disposition to keep on the safe side until the outlook becomes clearly distinct. Present conditions are satsisfactory, and as there appears to be very little chance for any sudden advance in prices, there is no inducement for anticipating requirements. Of course this is materially different to last year's operations, when buyers were anxious to secure every ton of Iron that they could possibly use for months in advance, but that in itself is no indication that prices will go either up or down, or that less Iron will be wanted. From present appearances there will be no decrease in consumption, but it is clear that production will be much larger and prices will depend entirely on the proportion between supply and demand. The present idea is that there will be no such scarcity as last year, because of the better railway facilities and the better supplies of Coal and Coke, and besides that there is a great deal of foreign material coming in, so that it is not extravagant to figure on a 10,000,000-ton supply of Pig Iron for the last half of 1903. Of course, a great many things might occur to change this view of the situation, but the feeling in the trade is about as stated, although it is recognized that the period of prosperity has been extended much beyond the ordinary course, and for the present at least, there is a determination on all sides to sail close to the wind and to take as little risk as possible.

Pig Iron.—According to recent reports the market in this district is in better condition than those at a distance. There is something of a scarcity for prompt shipments, some grades are extremely scarce, but not to an extent to place much of a premium on spot deliveries, although the lower prices quoted for the last half of the year amount to pretty much the same thing. This in fact appears to indicate the situation pretty clearly—viz., that prices may perhaps be maintained until midsummer, but after that date most people look for lower prices. This, of course, is merely a guess, and guesses have been so far astray during the past three or four years that they may be so again, but in any case it is not improbable that producers of Pig Iron are catching up with consumption. There should be nothing alarming in that, however, as it is something that must be reckoned with sooner or later, and it can be more easily dealt with by taking time by the forelock. The action of the Southern furnaces may have hastened the movement somewhat, but it was a wise precaution, and Pig Iron at $21 is a safer proposition than at $23 and upward; yet even $21 is not an

ample safe guard against foreign Iron, of which there are still considerable quantities under contract for the American market. The best guarantee against any sudden or important drop in prices, however, is the fact that there are no stocks of any account—either on furnace banks or in consumers' yards—and furthermore, unless all signs fail, there is going to be demand enough to prevent any such accumulation for some time to come, although it is evident that for the present the day of absolute scarcity is at an end, unless something very unforeseen occurs. Meanwhile business is moderately active, the current output being taken without the necessity for any change in prices. For later deliveries there is a kind of "stand off." Producers are not forcing the market, but buyers are decidedly offish, and are disposed to wait further developments before committing themselves to new engagements. The impression is that further reductions will be necessary before buyers take hold, although in the meantime it cannot be said that there is any real weakness, and the change (if there is any) will be more in the nature of an adjustment to changed conditions than to inherent weakness. Prices are a little irregular, but a fair average of the market would be about as follows for Philadelphia or nearby points deliveries to July, later dates fractionally lower:

No. 1 X Foundry	$22.50 to $23.00
No. 2 X Foundry	21.25 to 21.75
No. 2 Plain	20.50 to 21.00
Gray Forge	19.00 to 20.00
Basic	19.75 to 20.25
Middlesbrough, No. 3	20.50 to 21.00
Scotch	22.00 to 23.50

Cargo lots, c.i.f.:

Low Phosphorus, 0.035	$21.25 to $21.50
Bessemer	20.25 to 20.50
Middlesbrough, No. 3	18.50 to 19.00

Billets.—There is a great scarcity of Steel, and to secure prompt shipments very full prices have to be paid. German Billets are quoted at $29.50 on dock, c.i.f. duty paid, and domestic Basic, O. H., at $33 to $34, in buyers' yards, but at these prices the lots taken are not large and are for immediate shipment.

Plates.—There is a good demand for medium sized lots, and prices are steady with some indications of increasing firmness. The mills are taking in enough business to offset deliveries, so that prospects for continued activity are quite favorable. Orders for something like 5000 tons of Plates and Shapes were placed by C. B. Houston & Co., the business being distributed among three of the local mills, several other orders for lots of 1000 tons each being secured through other sources. Prices are unchanged, and quoted as follows on the general run of business: Small lots, 2c. to 2.05c.; carload lots, ¼-inch and thicker, 1.85c. to 1.90c.; Universals, 1.90c.; Flange, 2.10c.; Marine, 2.15c. to 2.20c.; Fire Box, 2.25c. to 2.30c.

Structural Material.—There is a pretty good demand and mills are taking in some good sized orders for delivery during the summer months. Prospects in this line seem to be improving and prices are strong but not quotably dearer, although some sizes command a slight premium. Sales mostly at about the following figures for carload lots as a minimum quantity: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.78½c.; carload lots as a minimum, with the usual adition for smaller quantities.

Bars.—The demand is not particularly urgent, but there appears to be enough work to keep things moving without the necessity for changing quotations. Prospects are regarded as favorable for a large business, but there is some dissatisfaction that prices are out of proportion with the high cost of material, labor, &c. Prices are about as follows: Best Refined Iron Bars, 1.93½c. for carload lots as a minimum quantity, and 1.75c. to 1.85c. for Steel Bars.

Sheets.—There is a good demand and prices are very strong. Mills are entering a great deal of business and are likely to be crowded with work during the summer months. Prices are about 3c. for No. 28 in carload lots, with the usual addition for smaller quantities.

Old Material.—Prices are firm with a good demand for pretty much everything on the list. Sales are mostly at medium to outside figures, with occasional sales at the bid prices. Bids and offers are as follows for deliveries in buyers' yards:

Old Steel Rails	$21.50 to $22.00
Heavy Steel Scrap	20.75 to 21.50
Low Phosphorus Scrap	28.00 to 29.00
Old Steel Axles	26.00 to 27.00
Old Iron Rails	25.00 to 25.50
Old Iron Axles	30.00 to 31.00
Old Car Wheels	24.00 to 25.00
Choice Scrap, R. R. No. 1 Wrought	23.50 to 24.00
Country Scrap	20.00 to 21.00
Machinery Scrap	20.00 to 21.00
No. 2 Light Scrap	18.50 to 19.50
No. 2 Light (Ordinary)	14.00 to 15.00
Wrought Turnings	16.50 to 17.00
Wrought Turnings, Choice Heavy	17.50 to 18.00
Cast Borings	11.50 to 12.00
Stove Plate	15.50 to 16.00

William Dette & Co. of this city have been appointed agents for the sale of Rock Run Charcoal Car Wheel Iron, made at Rock Run, Ala.

Cincinnati.

FIFTH AND MAIN STS., April 22, 1903.—(*By Telegraph.*)

The Pig Iron market so far at least as Foundry and Mill grades are concerned is still at a standstill on what is practically an unchanged price-list. What little trading there is is for spot shipment, and perhaps these minor sales aggregate more than such sales usually do. Selling agencies report quite a few lots of Iron to resell for buyers, this being Iron bought on a lower basis, delayed delivery, and now salable at a nice profit. In selling this Iron the admission is made that regular prices are cut a little. Just how much of this irregular Iron is really being sold is very hard to determine, but it is pretty nearly a settled fact that what Iron is selling is on the basis of the minimum prices quoted herewith, or on the general basis of $17 for No. 2, Birmingham. The feeling in the market is not a comfortable one, and sellers seem up in the air as to outlining the future. Many large buyers are supplying themselves only as to daily needs, and the belief in lower figures seems strong on that side of the market. The situation, while statistically strong, is certainly tinged with a marked mixture of pessimism as to prices. While there have been sales of Ohio Silvery Irons at less than the minimum figures it is contended by other sellers that 8 per cent. Silicon or Ohio No. 1 cannot be touched for less than $28 at the Jackson County Furnace district. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1	$20.75 to $21.25
Southern Coke, No. 2	20.25 to 20.75
Southern Coke, No. 3	19.75 to 20.25
Southern Coke, No. 4	19.25 to 19.75
Southern Coke, No. 1 Soft	20.75 to 21.25
Southern Coke, No. 2 Soft	20.25 to 20.75
Southern Coke, Gray Forge	19.00 to 19.50
Southern Coke, Mottled	19.00 to 19.50
Ohio Silvery, No. 1	29.15 to 30.15
Lake Superior Coke, No. 1	23.15 to 24.15
Lake Superior Coke, No. 2	22.15 to 23.15
Lake Superior Coke, No. 3	21.15 to 22.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$28.25 to $29.25
Lake Superior Car Wheel and Malleable	27.50 to 28.50

Plates and Bars.—The market is rather quiet on an unchanged basis. We quote, f.o.b. Cincinnati, as follows: Iron Bars in carload lots, 1.92c., with half extras; same, in small lots, 2.20c., with full extras; Steel Bars, carload lots, 1.73c., with half extras; same, in small lots, 2.20c., with full extras; Plates, ¼-inch, in carload lots, are still nominally 1.70c.; 3-16 inch, 1.80c.; Beams and Channels, 1.70c., base.

Old Material.—The market is quiet and unchanged. We quote dealers' buying prices as follows, f.o.b. Cincinnati: No. 2 Wrought Railroad Scrap, $20.50 per net ton; Cast Scrap, $17.50 per net ton; Iron Rails, $23 per gross ton; Long Steel Rails, $22.50 per gross ton; Short Steel Rails, $18 per gross ton; Iron Axles, $27.50 per net ton; Car Wheels, $24 per gross ton; Low Phosphorus Steel, $25 per gross ton; Heavy Melting Steel, $20 per gross ton.

St. Louis.

CHEMICAL BUILDING, April 22, 1903.—(*By Telegraph.*)

Pig Iron.—Generally speaking, the Pig Iron market for the past week has been quiet, although a continuance to a fair extent of the scattering buying in small lots is reported. The feeling in certain quarters seems to be growing more pronounced that the buying for future necessities cannot be held off a great while longer, as many of the large consumers of Iron in this territory are carrying a very short reserve. No. 2 Foundry on a basis of $17.50, Birmingham, is the price very generally maintained for quick as well as future delivery. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$21.75 to ....
Southern, No. 2 Foundry	21.25 to ....
Southern, No. 3 Foundry	20.75 to ....
Southern, No. 4 Foundry	20.25 to ....
No. 1 Soft	21.75 to ....
No. 2 Soft	21.25 to ....
Gray Forge	19.75 to ....
Southern Car Wheel	28.50 to $28.75
Malleable Bessemer	25.25 to 25.50
Ohio Silvery, 8 per cent. Silicon	32.50 to 33.00
Ohio Strong Softeners, No. 1	.... to ....
Ohio Strong Softeners, No. 2	.... to ....

Bars.—Jobbers' reports indicate a good volume of trade for both Iron and Steel Bars. Prices hold at about the same level from the mills: Iron Bars at 1.85c. to 1.90c., and Steel Bars at 1.82½c. to 1.90c., half extras. Jobbers name 2.15c. to their large trade, and to the smaller consumers 2.25c. is quoted.

Rails and Track Supplies.—Conditions affecting this department are little changed, and the demand continues very steady for all classes of supplies under this head. Prices are firm, and quoted as follows: Splice Bars at 2.05c. to 2.25c.; Bolts, with Hexagon Nuts, 3.05c. to 3.25c.; with Square Nuts, 2.95c. to 3.10c.; Spikes, 2.30c.

Angles and Channels.—From the jobbers' standpoint the demand and inquiry at this time for Small Angles and

Channels are said to be very satisfactory. For this class of materials the trade continues to quote 2.25c. to 2.40c. in lots from store.

Pig Lead.—The demand, while in good volume, is somewhat lighter than that recently prevailing, and together with the disposition to realize in certain quarters has given the market a mild sagging tendency the past week. Chemical is quotable at 4.50c., while Desilverized stands at 4.57½c.

Spelter.—Consumption continues large for Spelter, and market conditions are generally firm and steady. Quotable at 5.40c.

A leading interest has just closed contracts for about 5000 tons of Bessemer Iron for second half delivery.

Cleveland.

CLEVELAND, OHIO, April 21, 1903.

Iron Ore.—On Monday the first contracts were made for the transportation of Iron Ore down the lakes for the season. The United States Steel Corporation led the list, covering upward of 1,500,000 tons of Ore for the entire season, or up to November 26, at 85c. from Duluth to Ohio ports; 75c. from Marquette to Lake Erie, and 65c. from Escanaba to Lake Erie ports. It had been generally expected that the differential on Marquette and Escanaba against Duluth would be lessened, but the Steel Corporation took no cognizance of the general demand of the united vessel interests. When the contracts were finally made between the Steel Corporation and the local vessel interests the bidding for tonnage on season contracts became quite general and it begins to look as if, before the week is out, there will be an enormous amount of business done. Some indication had been previously given of what rates might be expected by the chartering of a few boats for wild cargoes the latter part of last week. These charters were for the first few loads down the lakes. The head of the lakes rate was identical with the season contracts, but Marquette is bringing 80c. on going charters at the opening of the season. The shippers are now making an effort to clear the docks before the big spring shipment down the lake begins. The shipments from Cleveland alone last week were 64,000 tons, with other ports shipping commensurate amounts. At one or two ports dock shipment has been stopped, because of the incoming Ore and because the piles have about been cleaned up.

Pig Iron.—The Foundry Iron situation does not change very greatly. The demand in this immediate territory for material for spot shipment has not abated in the least. The Southern Ohio and the Southern furnaces are able to dispose of their surplus here without inconvenience. In some places consumers have been at a disadvantage because they have not been able to obtain the amount required. While this has been the case, and while prices have strengthened, there have been no advances. The buying for second half delivery is still held up for some reason. Consumers have continued to make inquiries and to hint that prices ought to be lower than they are now. In fact, it is generally held that the lack of buying for second half delivery is directly due to the prices quoted for that period. The Valley furnaces are all running full and there is an active demand for all the material that can be turned out and more, and the furnacemen are not inclined to shade second half delivery prices. The quotations therefore remain as follows: No. 2 Foundry, first half delivery, $22, Southern Ohio furnace; second half delivery, $21 to $21.50, Valley furnace. Operations in Basic have been reduced to the minimum. The buying for the first half continues when any material is presented, but the sales are altogether in very small lots of carloads and less, few sales exceeding that volume. For second half delivery there have been no sales reported for the past two weeks of any volume. Prices have not changed from $21.50 to $22, Valley furnace, for first half delivery, and $20 for second half delivery. Bessemer Iron is still not in much demand and the market is quiet. Nothing remains for sale for the first half and the buyers have not covered for the second half to any appreciable extent. The quotations have not changed, being, however, purely nominal at $21.50 to $22 for first half and $20.50 to $21 for second half, Valley furnace. About all of the furnaces in the Valleys are now in operation, suspensions being occasioned only by the necessity to make repairs. The fuel supply is adequate. During the past two weeks big improvements have also been made in deliveries and the railroads are meeting the demands upon them without difficulty.

Finished Iron and Steel.—Bar consumers are beginning to come into the market pretty freely, although there is still some feeling of hesitancy, which is not easily explained. Mere lack of interest in future buying, when there is no immediate and imperative need, may be the cause of the backwardness. Five or six of the smaller buyers have come into the market during the past week, and the reports indicate that upward of 6000 tons of Bessemer Steel have been covered. The big buying, however, still seems to be in future. The Bar Iron trade has been very light. The buying has been nothing to speak of, and the trade has been discouraged by the larger mills as much as possible. The inquiries have kept up, however, to a greater extent than the producers care for. The price has held firm at 1.85c., Youngstown. The price on Bessemer Bar Steel has been 1.60c., Pittsburgh, without variation, and the Open Hearth product has been sold at 1.70c., Pittsburgh. The market in Structural Material seems to have become stronger generally. A short time ago there was manifest some weakness, due to inactivity in the general building operations in this particular territory. Within the last week operations have been resumed to a greater or less extent, and several contracts were closed. The inquiries have come in also in such quantities as to indicate a good run of business ahead. The prices have not changed, the standard mills getting 1.60c., Pittsburgh, while the smaller mills are asking 1.70c. to 1.80c. at the mills. The jobbers are getting 2.15c. to 2.25c. Deliveries vary according to the size wanted, some sized shapes being available in a few weeks, while the larger sizes are not obtainable within two or three months. One order of 2500 tons of Plates was closed during the past week. This required prompt shipment, and was accepted by the mill. The surface indication was of a slight weakness in the market, which, however, is not borne out by the general condition in the market. The larger mills are refusing to accept any tonnage, and the smaller mills are pretty well filled up with orders. Prices are unchanged, the standard mills getting 1.60c., Pittsburgh, and the smaller ones commanding 2c. at the mill, with some concerns shading that price on special orders. The Sheet trade is strong. The buying has been quite heavy during the past week, and the outlook is bright. Prices have not changed, and there is hardly a possibility that any change would be made. The quotations, therefore, are: 3.10c. to 3.25c. for No. 27 Black Sheets out of stock; the same gauge bringing 2.85c. to 2.95c. from the smaller mills. In Rails there has been but little done lately, because the mills have about reached the limit of their capacity. There are still inquiries on material coming from the electric lines, but they have not been offered satisfactory delivery by the larger mills. The demand for light Rails is good, and the supply is adequate. Prices are $28 for Standard Rails and $36 for the lighter grades.

Old Material.—The market has been firm with heavy buying in certain grades. In Steel Scrap there is a scarcity of material that is hampering the mills to some extent. Prices are as follows: No. 1 Wrought, $19.50, net; Cast Borings, $12, gross; Car Wheels, $22.50, gross; Heavy Steel, $20.50, gross; Iron Rails, $25.50, gross; Iron Axles, $27.50, gross; Wrought Turnings, $14.50, gross; Old Steel Rails, $21, gross.

Extensive improvements have been made by H. Emerman & Co., dealers in Scrap Iron and Steel, at their yards, 1008 to 1040 Seneca street, Cleveland, Ohio, on the Baltimore & Ohio Railroad. Two new shears are being placed, besides a drop and a large moving crane. The yard has been doubled in size.

Birmingham.

BIRMINGHAM, ALA., April 20, 1903.

The conditions surrounding the Iron market the past week indicated a very quiet market. The transactions were, in magnitude, materially less than were registered the preceding week, but it is claimed that prices were well maintained, and what business was concluded was on the basis of values lately established. There were some large interests in the market, but they bought very sparingly and only to cover pressing necessities. After their orders were registered they appealed for prompt shipment to prevent their works from closing and declared that they were bare of stock. Some admitted that they were holding off with the hope of getting in at lower values, and at the same time admitted that the outlook was such as to make success problematical. The purchases were, in the main, for prompt and nearby delivery, and those for the last half of the year one might say were nominal, as in magnitude they were light. Sellers as a rule are hewing close to the line of prices lately established, and if there is any concession in prices it is closely guarded. None is admitted. Sellers declare that the situation favors the maintenance of prices, and they can afford to wait for the incoming tide, which will absorb what they can produce. As one of them declared himself to your correspondent: "We can afford to wait for the necessities of the buyers to compel them to come into the market, and when they do come they will find no surplus of Iron above market requirements. All we may have and can produce will be wanted, and we have no fear of inability to market all we can produce at reasonable prices." There have been some reports of shaded prices, but efforts to confirm them have not been successful. With such a market as at present exists we must anticipate and look for variations in prices. The price now is in the neighborhood of $3 per ton over a year ago, and this excess is about the same that prevailed over present prices, not counting the extreme prices.

Those representing the outside furnaces are a little easier in prices than those who are in the Associated Furnace Combination, but they are not publishing their prices, and it is no easy matter to obtain them. Inferences are easy to arrive at but solid facts are withheld. Shipments are as free as facilities permit, and deliveries on contracts are fast

catching up. When July rolls around there will be very little in default on delivery. There have been a few lots of 500, 1000 and 1500 tons placed the past week, and more of lots aggregating 500 tons and less—showing that the trading was comparatively light. But the indications point to an increasing trade, and the larger interests are confident of its fulfilment. When you invite information as to prices a blanket is spread and association prices printed thereon. There is no reason for disputing them, and they must be accepted as correct. If there is any deviation it is only occasional. So we can only quote the market as on the basis of $16.50 for shipments to the Atlantic States, and at $17.50 for shipments to the Western and Southern States for No. 2 Foundry.

The Woodward Iron Company at last announce their intention to build a third furnace stack, the capacity to be at least 350 tons. The two furnaces now in commission will be rehabilitated, and the plant will be modernized in every way. As soon as the stack now out is put in the work on the new furnace will begin, and at some time within the next 12 months the daily output of the Woodward Iron Company will be 600 tons of Iron. The company have also given an order for the largest Ore crusher ever brought South, the capacity being 400 tons of Ore per hour. It is calculated that it will be ready for business within the next four months. But four others of this magnitude have been so far made.

The Philadelphia furnace of the Sloss-Sheffield Company, at Sheffield, Ala., will be blown in on the 20th inst. It has cost $100,000 to rehabiliate it and make it modern. The sales made the past week have been to Atlantic Coast points and to Pittsburgh points as well as to Southern points, and for account of local parties.

Pittsburgh.

(By Telegraph.)

PARK BUILDING, April 22, 1903.

Pig Iron.—While the Pig Iron market continues somewhat quiet, and prices are none too strong, there is a fairly good inquiry, and especially Malleable Bessemer Iron, of which several round lots have been sold in the past week at prices ranging from $19.25 to $19.50, at Valley furnace. Bessemer Iron is a little off in price, and prompt Iron is being offered at $20, Valley furnace. For shipment over last six months of this year Standard Bessemer Iron is being offered as low as $19.50, at furnace. There is not much doing in Gray Forge Iron, which is also somewhat weak in price, Northern brands being offered at $20.25 to $20.50, while Southern Forge is freely offered at $19.85, Pittsburgh. There is not much doing in Foundry Iron, Northern brands of No. 2 being held at about $21.50 for prompt shipment and $21 for forward delivery. Southern No. 2 Foundry is offered at slightly lower prices.

Steel.—There is an active demand for Steel, and as the supply is limited high prices are being obtained. Bessemer Billets, for prompt delivery, bring $30.50 to $31, maker's mill, and Open Hearth Billets $31 to $32, maker's mill. It is said that Steel has been sold by outside mills at a price equal to very close to $32, Pittsburgh, for 4-inch Bessemer Billets. The larger consumers of Steel are mostly covered by contracts on a sliding scale basis, which make the prices of Steel somewhat lower than are quoted above.

Coke.—The Coke situation has been completely reversed in the last month, and instead of a scarcity there is now a surplus of Coke, and prices have declined sharply. It seems that a number of blast furnaces overbought when Coke was scarce, and now that this Coke is being shipped in promptly they find that they have more Coke than they can use, and some of it is being offered for resale. Furnace Coke on track has been offered as low as $4 a ton. Unless there should be another scarcity in cars it looks as though the price of Furnace Coke for the last six months would not be above $3.50 a ton, and it may be lower.

(By Mail.)

Matters in the Iron trade continue quiet, the market being in a waiting attitude. Contract rates for carrying Ore down the lakes this season will be 85c. between Duluth and Ohio ports, 75c. from Marquette to Lake Erie and 65c. from Escanaba to Lake Erie. This is an advance of 10c. a ton over rates of last year. The effects of the cut in prices of Southern Iron are said to be gradually disappearing, and the Pig Iron market is referred to this week as being a little stronger than at any time since the cut in prices was made. Bessemer Iron for shipment over last six months is still quoted at $20, at furnace, but very little tonnage is being sold, buyers holding off, believing that prices may be lower. Northern Forge Iron is held at $20.25 to $20.50, and Southern Forge at $19.85, Pittsburgh. Northern No. 2 Foundry Iron for prompt shipment is about $21.50 and $21 for extended delivery. Southern No. 2 Foundry is $20.85, Pittsburgh. The Steel market continues very firm, Bessemer Billets for prompt shipment being $30 to $30.50, while for shipment over last six months about $29, at mill, is quoted. In Finished Iron and Steel the market is reasonably firm and a good deal of tonnage is being placed, notably in Plates.

Steel Rails.—The market is very quiet, no large orders being placed. It is possible that the Ohio Works of the Carnegie Steel Company at Youngstown, Ohio, may be switched from Rails to Billets on account of the shortage in supply of Steel. We quote Steel Rails for standard sections at $28 in 500-ton lots and over, maker's mill.

Plates.—Demand for Plates is reported by the leading mills to be very large, and a number of inquiries for round lots for shipment over last six months have recently been turned down by local mills that are so well filled up they cannot make deliveries wanted. The Steel Car industry is taking an enormous tonnage of Plates, and most of these are being filled by local mills. Plates for prompt shipment continue to command from $2 to $4 a ton over regular prices, which are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Muck Bar.—The market on Muck Bar is not quite as firm as it was, and we quote domestic grades at $35 to $35.50, f.o.b. Pittsburgh. A sale of 500 tons is reported at the lower price.

Structural Material.—Among contracts placed recently was one for 1700 tons for grade crossings at Buffalo, N. Y., taken by the American Bridge Company. A good deal of bridge work is coming up, which will require a very heavy tonnage. It is said the new works of the National Tube Company at Lorain and McKeesport will require about 35,000 tons of Structural Steel, all of which, however, will not be placed this year. The strike of the Structural Iron workers is practically settled and active work on the Wabash bridge in this city, and other large jobs as well, will now go forward actively. Deliveries of Structural Material are being made very promptly by the mills and there is practically no complaint on this score at present. We quote: Beams and Channels up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.85c.

Iron and Steel Bars.—A moderate amount of tonnage is being placed in Iron and Steel Bars, but there is no denying the fact that business is not as large as the mills would desire. This is specially true of Steel Bars, tonnage being much smaller this year than formerly. Buyers are not placing as large contracts as usual, being willing to take chances on the market later in the year. Prices are reasonably firm, but without change. We quote: Iron Bars at 1.85c. to 1.90c., Pittsburgh, in carload lots and 1.95c. in small lots, half extras, as per National card. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra regardless of length.

Spelter.—The market on Spelter is firm and prime Western grades are held at 5.48½c., Pittsburgh, for futures and 5.53½c. for spot shipment. Some consumers believe that prices on Spelter will be lower before long.

Sheets.—As yet no announcement has been made by the leading interest of any advance in price of Sheets, but a general upward movement is expected before long, and a few of the mills have already advanced quotations, one or two concerns quoting as high as 3c. for No. 28. Several of the leading mills state that the demand for Black and Galvanized Sheets is better than for some time. We quote as follows: Nos. 22 and 24, box annealed, one pass through cold rolls, 2.45c.; No. 26, 2.55c.; No. 27, 2.65c., and No. 28, 2.75c. These prices are for carloads and larger lots and are minimum of the market, jobbers charging the usual advances for small lots. Galvanized Sheets are now 75 and 10 off, which is equal to 3.60c. for No. 27 and 3.85c. for No. 28. These prices are for carloads and larger lots, and are f.o.b. at mill.

Spikes.—Demand continues active and prices are firm. We quote Boat and Railroad Spikes at $2.25 per keg, f.o.b. Pittsburgh.

Merchant Steel.—Only a fair amount of new tonnage is being placed, and some of the mills could handle a good deal more business if they had it. Some contracts for Agricultural Steel have recently been placed, several of these running into 1904 shipment. There is more or less unevenness in prices of Tool Steel. Shafting is firm and demand is fair. We quote Tire Steel, 1.80c. to 1.90c.; Open Hearth Steel, ordinary grades, 1.70c. to 1.80c.; Open Hearth Spring, 2.25c.

to 2.35c.; Cant Hook Steel, 2.50c.; Plow Slabs, Bessemer, 2.50c.; Plow Slabs, Open Hearth, 3.75c.; Tool Steel, ordinary grades, 6½c. and upward; Cold Rolled Shafting, 42 per cent. off in less than carloads, and 47 per cent. in carloads, delivered in base territory.

Hoops and Bands.—The mills are pretty well filled up, and a fair amount of new tonnage is being placed. There is no change in prices, which are as follows: Cotton Ties at 88c. in 5000-bundle lots and over, and 91c. for less quantities, f.o.b. mill. Steel Hoops are 1.90c. for 250-ton lots or over, and 2c. in small lots, full extras. Bessemer Bands are 1.60c. up to No. 12 gauge, and Open Hearth 1.70c., f.o.b. mill, extras as per Steel Card.

Skelp.—The market is somewhat quiet, but most of the leading Skelp mills are pretty well sold up for the next several months. There is no change in prices, and we quote Grooved Iron and Steel Skelp at 2c. to 2.05c., and Sheared 2.05c. to 2.10c., f.o.b. Pittsburgh, or 2 per cent. off for cash in 30 days.

Rods.—The supply is short, as the leading makers are barely able to meet the requirements of their own finishing departments. The nominal quotation is $37, Pittsburgh.

Tin Plate.—Demand for Tin Plate is heavy, and the mills are booking a good deal of tonnage. For prompt delivery outside mills are getting from 10c. to 20c. a box over official price of the leading interest. We quote ordinary Terne Plate at $3.80 to $4 a box, f.o.b. Pittsburgh.

Pipes and Tubes.—Demand is not quite as active as some time ago, but the mills are pretty well filled up and prices are firm. Several large contracts for Line Pipe are being figured on and on the larger sizes of Pipe the mills are sold up for four to six months. Prices are firm, and discounts in carload lots to consumers are as follows:

Merchant Pipe.

	Steel.		Wrought Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56
Plugged and Reamed:				
1 to 4 inches	73	63	70	60
Cut 3 to 6 feet:				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inches	71	60	68	57
7 to 12 inches	65	53	61	50
Cut 6 feet and longer:				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inches	72	61	69	58
7 to 12 inches	66	54	62	51
Extra Strong Plain End:				
⅛ to 8 inches	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End:				
½ to 8 inches	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ per cent. advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet.

Old Material.—Demand for Heavy Melting Stock is active and it is somewhat scarce. The general demand for Old Material is good and prices are firm. We quote Heavy Melting Stock at $21.50 to $22 in gross tons. No. 1 Wrought Scrap is $21 to $21.50 in net tons; Steel Rails, short pieces, are $21.50 to $22, gross tons, and Low Phosphorus Melting Stock is $24.50 to $25 in gross tons.

Coke.—The supply of Coke is very much larger than for some time, and as a result prices are easier and somewhat weak. Consumers are holding off placing contracts for both Furnace and Foundry Coke for last six months in the belief that prices will be lower when they are ready to buy. We quote Furnace Coke for prompt shiptment at $4.50 to $5 a ton, and 72-hour Foundry, $5.50 to $6 a ton. Furnace Coke on contracts for last six months' delivery is being offered at $3.75 a ton and possibly lower. Foundry Coke on contracts is about $5 a ton at oven.

The offices of the Executive Department of the Carnegie Steel Company have been removed from the third floor to the eleventh floor of the Carnegie Building, Pittsburgh. Room 1108 has been reserved for the use of Andrew Carnegie, which has been the custom of the Carnegie Steel Company for many years. Rooms 1109 and 1111 will be reserved as board rooms, where the Executive Board will hold its sessions. W. E. Corey, president, occupies rooms 1112 and 1113; W. C. McCausland, treasurer, occupies rooms 1117 and 1118; W. W. Blackburn, secretary, has room 1120, and Elmer E. Slick, chief engineer, has room 1121. W. R. Balsinger, chief of Ordnance Department, has room 1123. Room 1127 is occupied by Homer J. Lindsay, assistant to the president.

Charles W. Baker and Marshal R. Ward have been elected directors of the United States Shipbuilding Company to fill existing vacancies.

Trade Publications.

Chain Blocks.—A catalogue from D. Round & Son, Cleveland, Ohio, contains descriptions and price-lists of their chain blocks, hoisting crabs, derrick winches, &c. Their quadruple helical screw block is the only hoist of any design on the market at present made in 15 and 20 tons capacity. These blocks are self sustaining, working on the screw principle, and the weight cannot run down of its own accord. In single blocks of this type the power required for lifting is only about 5 per cent. of the weight raised, and is, of course, proportionately reduced in double and treble blocks.

Pulley Turning Lathes.—The A. Streit Machine Company of Cincinnati, Ohio, have prepared a catalogue dealing with their 30 and 36 inch pulley turning lathes; also their boring lathes and pulley drilling and tapping machines. The first is provided with two tool rests, one mounted on a rail on each side, and feeding in opposite directions. The rails are placed on a table that swivels in the center, and they may be moved in or out to accommodate the different diameters of pulleys. An arbor fits into the spindle like the center of an engine lathe.

The Link Metallic Car Roof, made by the Inland Equipment Company of St. Louis, Mo., is proof against leakage, as there are no nails driven through the metal, and the application of the sheets is such that if water leaks through the outer roof of wood it will immediately run off. When completed, the roof is practically one piece, and is proof against the bad effects of straining and twisting of the car incident to its operation.

Wood Working Machinery, manufactured by the Crescent Machine Company of Leetonia, Ohio, consisting of resawing band saws, sprue cutting saws, foot power and power band saws, combination saw tables, pointers, &c., are described in a catalogue just issued.

Electric Elevators and Appliances.—The Elektron Mfg. Company of Springfield, Mass., have issued a handsome catalogue fully describing and illustrating their electric elevators and various appliances appertaining thereto. Their automatic electric elevators for residences have been so simplified and perfected as to meet every requirement in that service and may be operated with ease and entire safety by a child old enough to press a button. The elevator may be operated by a push button, which is located at each landing, or by any one of a series of push buttons located in the car and numbered to correspond with the various floors. On pressing a button at any landing, the car, if it is not already in use, will come to that landing and stop automatically. On entering the car the passenger has only to press the proper button, and the car goes to the floor desired and there stops automatically. The danger that a person at some other landing may start the elevator just as the passenger is stepping out of the car is entirely removed by automatic well door switches, which absolutely prevent starting of the machine while any well door is open.

Steel Castings.—The American Brake Shoe & Foundry Company of New York and Chicago have prepared a pamphlet dealing with their "Tropenas" steel castings. This process of making cast steel is only one of the many methods of converting pig iron into refined steel, all of which may produce the desired grade of metal; but this particular method has been selected by the above company as being particularly adapted to the production of high grade metal by a process which need not be continuous, as in the open hearth, and which is in a measure flexible. It consists in the use of special converters, in which pig iron, previously melted in a cupola, is subjected to an air blast of 3 to 4 pounds' pressure, directed horizontally across the top of the molten bath. This action generates intense heat, the result being a bath of nearly pure iron. The process is finished by the addition of ferromanganese or ferrosilicon, or both, to bring up the silicon, manganese and carbon contents to the specified proportions.

Steam Separators, of various types and adapted to every range of steam work, are described in a pamphlet by the Austin Separator Company of Detroit, Mich.

"How to Pack Gas Engine Cylinder Heads" is an interesting leaflet, by the H. W. Johns-Manville Company of New York, giving full directions for cutting gaskets, preparing the flange and applying the gasket, so that the most efficient service may be obtained. The difficulty of packing cylinder heads for gas engines for stationary, launch or motor service has been one of the discouraging features in the use of these engines. The methods described in the leaflet have been proved by years of experiment to be the only successful way to avoid these difficulties and secure the best results.

The Carnegie Steel Company's Pocket Companion.—A new edition has just been published by the Carnegie Steel Company, Empire Building, New York, and Pittsburgh, Pa., of their Pocket Companion. The book contains illustrations of the various sections of beams, channels, angles and other shapes of structural steel, tables of di-

mensions and weights of bars, sizes of rectangular plates, weights and dimensions of beams and other structural shapes, illustrations of constructional details, notes on foundations, wind bracing and other features of construction, tables of safe loads, properties of beams and other structural shapes, a great deal of information relative to columns, safe loads of beam, box and plate girders, details of connections for framing, tables of dimensions and weights of nuts, standards of eye bars, manufacturers' standard specifications for steel of different forms and other information useful to engineers. The book comprises 321 pages of printed matter, and is substantially bound in flexible leather covers. **The price is $2 per copy.**

The American Iron and Steel Association, 261 South Fourth street, Philadelphia, have issued a Supplement to the *Directory to the Iron and Steel Works of the United States*, comprising a volume of 196 pages. The Supplement contains practically complete lists of the following leading consumers of iron and steel: Iron and steel bridge building works; iron and steel shipbuilding plants; locomotive works; all kinds of car building works; car wheel works; car and locomotive axle works and steel locomotive tire works; chain works; cast iron pipe works; wrought iron and wrought steel pipe and tube works; riveted pipe works and seamless drawn tube works; wire works, wire nail works, cut nail works and horse nail works; works for the manufacture of cold rolled, cold drawn, turned, polished and ground shafting; stamping and metal ceiling works; malleable iron works; bolt, nut and rivet works, and works for the production of all kinds of heavy and light forgings, including drop forgings. It also contains a full account of the organization of recent consolidations in the iron trade, most of which were not described in the *Directory*. The price of the book is $5.

The New York Machinery Market.

NEW YORK, April 22, 1903.

Another attempt is being made to dispose of a quantity of American machine tools in this market, which are at present a drug on the German market. Carl Kratz of De Fries & Co., Düsseldorf, is now in this country with a view of selling tools which his company have accumulated during the last three years or so with the intention of selling them abroad. The entire list, we are informed, amounts to something like $50,000. The tools are of standard makes, althought some are of slightly antiquated design. Mr. Kratz is making his headquarters at the offices of Knauth, Nachod & Kuhne, bankers, 13 William street, New York. Aside from their salesrooms at Düsseldorf, De Fries & Co. operate a large factory at Heerd-Lorick, near Düsseldorf, where all types of machine tools and other machinery are built.

General demand in this market for machine tools is good. One of the largest new projects in this immediate neighborhood is being brought out by the Pennsylvania Railroad. At their "Meadows" shops, between Jersey City and Newark, N. J., this company are remodeling their machine shops. They are erecting one large new steel structure, and have prepared plans for another. There is a good deal of machinery at the Meadows shops which is not strictly modern. This is to be relegated to the scrap heap to make room for new and thoroughly up to date tools. The new buildings will also be completely equipped with new machine tools. It will be recalled that the wood working shops at this point were modernized a short time ago and new shops added. The machine shops are now undergoing a similar change. H. S. Hayward, superintendent of motive power, with offices at Jersey City, is in charge of the work.

The bids opened by the Bureau of Supplies and Accounts for supplies for the Boston Navy Yard included the following machinery proposals:

Bidder 1. Crocker, Wheeler & Co., Ampere, N. J.

3. Montgomery & Co., 105 Fulton street, New York City.

4. New York Glass Company, 93 Canal street, New York City, informal; no guarantee.

5. John Harris, 29 Beekman street, New York City.

7. Evans, Almiral & Co., 281 Water street, New York City.

10. General Electric Company, Schenectady, N. Y.

12. Brown & Sharpe Mfg. Company, Box 29, Providence, R. I.

15. Sprague Electric Company, 527 West Thirty-fourth street, New York City.

17. Drew Machinery Agency, Manchester, N. H.

18. B. McMiles & Co., Twenty-first and Callowhill streets, Philadelphia, Pa.

19. Francis Harral, 85 Chambers street, New York City.

21. New York Steam Fitting Company, 137 Elm street, New York City.

22. Hill, Clarke & Co., 156 Oliver street, Boston, Mass.

24. Pratt & Whitney Company, 1 Flower street, Hartford, Conn.

27. Francis A. Williams, 211 West Twentieth street, New York City.

29. Rockwell Engineering Company, 26 Cortlandt street, New York City.

31. Chandler & Farquhar, 36 Federal street, Boston, Mass.

33. Bullock Electric Mfg. Company, Journal Building, Boston, Mass., informal; no guarantee.

36. Wilmarth & Mormon Company, 153 Canal street, Grand Rapids, Mich.

39. Becker & Brainard Milling Machine Company, Hyde Park, Mass.

41. The Holtzer-Cabot Electric Company, 9 Station street, Brookline Station, Boston, Mass.

42. The Mark-Flather Planer Company, 41 Bowen street, Nashua, N. Y.

43. The Niles Tool Works Company, Third and Mill streets, Hamilton, Ohio.

44. H. A. Rodgers, 19 John street, New York City.

45. New England Motor Company, 82 Fletcher street, Lowell, Mass.

46. The Morse Twist Drill & Machine Company, 100 Fifth street, New Bedford, Mass.

47. Prentiss Tool & Supply Company, 115 Liberty street, New York City.

50. Manning, Maxwell & Moore, 85 Liberty street, New York City.

Class 4. Electric motor—Bidder 41, $510; 10, $622; 45, $750; 15, $956; 1, $1047.50.

Class 13. Shafting—Bidder 43, $2129.94; 5, $2954.60.

Class 14. Tools—Bidder 3, $3936.95; 24, $4210; 19, $4539.41; 6, $4804.16; 31, $4889.01; 46, informal, bid on part of class.

Class 15, Shaper—Bidder 42, $500; 50, $575.

Class 16. Drills—Bidder 50, $90; 31, $110; 22, $117; 47, $118; 24, $159.

Class 17. Engine lathe—Bidder 22, $565; 24, $605; 47, $695.

Class 18, Tool makers' lathe—Bidder 50, $736; 47, $1050; 24, $1196.

Class 19. Turret lathe—Bidder 50, $450; 24, $457.

Class 20. Milling machine—Bidder 43, $540; 39, $550; 22, $600; 47, $640; 12, $678.50; 50, $735.

Class 21. Taper reamer and cutter grinder—Bidder 24, $110.

Class 22, Centering machine—Bidder 50, $115; 22, $191.65; 24, $215.

Class 23. Cutter and reamer grinder—Bidder 24, $229; 50, $250; 47, $322; 12, $554.

Class 24. Bench lathe—Bidder 24, $243.

Class 25. Turret lathe—Bidder 24, $673.

Class 26. Engine lathe—Bidder 22, $380 and $325; 24, $407; 47, $510.

Class 27. Planer—Bidder 47, $398; 22, $425; 43, $448; 50, $500; 42, $575.

Class 28. Hand milling machine—Bidder 22, $160; 39, $175; 24, $199.50; 31, $230.

Class 29. Drill grinder—Bidder 41, $749.50; 47, $962; 36, informal; bid on part of class.

Class 30. Furnace—Bidder 29, $6875.

Class 31. Steam drop hammer—Bidder 50, $1825; 17, $2030; 18, $2125.

Class 32. Heating plant—Bidder 7, $14,898; 2, $15,798; 27, $16,545.

Class 33. Shaping machine—Bidder 47, $3575; 50, $3675; 18, $4095.

Class 34. Cold sawing machine—Bidder 47, $1024; 43, $1025; 17, $1290.

Class 35. Copper pipe bender—Bidder 43, $1045; 44, $1050.

Class 36. Splitting shear—Bidder 17, $1122; 43, $1200; 47, $1224; 50, $1470 and $2070.

Class 37. Screw cutting engine lathe—Bidder 47, $675; 22, $680.

Class 38. Planer—Bidder 42, $3498.60; 43, $4190.

Class 39. Milling machine—Bidder 24, $975.

Class 40. Hammer core machine—No bids.

Class 41. Hydraulic beam bending machine—Bidder 43, $945; 44, $950.

Purchases of a good sized machinery equipment will soon be made by the Ford City Foundry & Machine Company of Ford City, Pa. The company were recently incorporated at $200,000 capital. A. G. Greenbaum, secretary of the company, is sending out inquiries. Contracts for the steel structure of the main building will be placed next week. In addition to this building, which will be 110 x 500 feet, and will serve as the machine shop, there will be a foundry, pattern shop and power station. The power equipment will aggregate 350 horse-power. The foundry will be of sufficient capacity to handle castings of 35 tons. All machinery will be operated electrically. No orders for equipment have been placed as yet.

Haines, Jones & Cadbury Company of Philadelphia are in the market for machinery for finishing brass goods. They have just had plans prepared for a four-story building to be added to their plant. Part of this building will be utilized as a brass foundry and part for finishing departments. The company manufacture plumbers' supplies.

Extensive purchases of power plant equipment and other machinery are being made by the Smokeless Combustion Company of 1 Broadway, New York. They are now re-

ceiving bids, and expect to award contracts in a few days for the complete equipment of a 1000-ton sugar refinery to be erected at Naugaba, Porto Rico. The pumps and other machinery in this plant will be electrically driven. The power plant will be of about 1200 horse-power.

They are also issuing specifications for the equipment of a 1000 horse-power plant to be erected at Decatur, Ala., for the Decatur Electric Light & Power Company. These purchases will be made within the next two or three weeks. They are also installing stokers and their cross draft furnaces under 2400 horse-power of Campbell & Zell boilers at the new refrigerating plant of the Hammond Ice Company, Baltimore, Md. The refrigerating machinery for this plant has been purchased from the De La Vergne Refrigerating Machine Company.

T. Cockerill & Son, 147 Columbus avenue, were awarded the general contract for building the "westward wing" addition to the Museum of Natural History, New York. In this work will be included the installation of a power plant. The sub-contracts for this work will be awarded by Cockerill & Son. The contracts to be awarded at this time will be for a 600 horse-power plant, including boilers, engines, generators and all accessories. At a later date this equipment will be duplicated, making the ultimate capacity of the plant 1200 horse-power.

The Rome Brass & Copper Company, Rome, N. Y., have just placed an order with Westinghouse, Church, Kerr & Co. for a steam turbine power equipment for a new rolling mill at Rome, N. Y. The present properties of the Rome Brass & Copper Company are located upon the banks of the Mohawk River, at Rome, N. Y., and comprise a number of rolling mils and other buildings, scattered over a considerable area. The manufacturing facilities afforded by these mills being inadequate, the company have under way a number of new mills located at a short distance from the old plant, and arranged with special reference to the ultimate centralization of motive power. One of the new mills will be operated entirely by electricity from an adjoining power house, where the boilers and turbine machinery will be located. The entire mill will be operated from one turbine, no relay being provided. The power unit consists of a Westinghouse steam turbine direct connected to a 400-kw. Westinghouse three-phase generator, designed especially for turbine driving. The present arrangements for boiler and condenser machinery are still incomplete, but it is probable that the turbine will operate under 150 pounds steam pressure, 26 or 28 inch vacuum, and possibly a moderate amount of superheat. The generator will furnish current at 440 volts and 60 cycles, which will be used at this voltage upon the motors driving the rolls in the mill. Each roll will be independently driven by a Westinghouse induction motor of suitable capacity.

The Palmer Mountain Gold Mining & Tunnel Company, who are located at Loomis, Okanogan County, Wash., will erect an electric plant this season to furnish power for their mines, which are located on Palmer Mountain, near the town of Loomis, consisting of 57 mining claims in a contiguous group, making 1020 acres of mineral land. The company are developing water power, which will furnish 300 horse-power. Immediately on the completion of the power the company will erect a 100-stamp mill of 300 tons capacity for reducing the ores. No purchases of machinery have as yet been made. The New York offices of the company are located at 56 Wall street.

The United Water & Light Company of Wilmington, Ohio, are receiving bids and will let contracts about May 1 for a 250-kw. and a 125-kw. generator, a 20 x 42 inch engine, also a 16 x 42 inch engine, three 200 horse-power water tube boilers and two 1,000,000-gallon pumps, 30 miles of wire and 10 miles of pole line; also 10 miles of water mains and a stand pipe, 18 x 120 feet. Sloan & Martin of Wilmington, Ohio, are counsel for the company, and E. D. Hurst, whose headquarters are at the office of this firm, is the superintendent of the company.

The Mohave Gold Mining Company of Arizona, whose Eastern offices are at 351 Bullett Building, Philadelphia, John Seward, manager, intend constructing a railroad about 12 miles long to connect a mill now being built with the company's mines at Needles, Cal., and are looking about for an Eastern contractor to undertake the work.

New York.

NEW YORK, April 22, 1903.

Pig Iron.—In this territory the buying movement is light. The attitude of buyers is illustrated by the fact that recently one of the largest foundries in this section came into the market for 10,000 tons, and received bids from importers as well as from domestic producers. Finally only 2000 tons of domestic Iron were purchased. Middlesbrough Iron has sold at $18.25 for moderate sized lots, and in cargo lots costs 56 shillings 6 pence, c.i.f., which is, duty paid, equivalent to a little more than $17.75. German Iron is practically out of the market. We quote, at tidewater, for prompt to early delivery: Northern Iron, No. 1, $22.25 to $22.75; No. 2, $20.50 to $21; No. 2 Plain, $20 to $20.50. Tennessee and Alabama brands in New York and vicinity, No. 1, $21.50 to $22; No. 2, $20.50 to $21; No. 3 Foundry, $20 to $20.50.

Steel Rails.—Inquiries for 1904 are making their appearance in the market, so that it may not be long before Rail makers announce their policy for next year. The decision to place a duty of $7 per ton on Rails in Canada has little immediate interest for the American mills, but in the future it may greatly curtail shipments to that country, which have been fairly large in past years. The Canadian Pacific order for about 40,000 tons, which has been up for some weeks, has not yet been closed. We continue to quote $28 at Eastern mill for standard sections.

Cast Iron Pipe.—The demand for small sizes continues active, and Eastern foundries are now so well supplied with work of this character that they are asking a higher price. On orders calling for large sizes competition is sharp, and prices are somewhat irregular. It is observed, however, that the lowest bidder on one lot of large Pipe may be among the higher bidders on subsequent lettings, showing that it is an easy matter to get filled up. Carload lots are quoted at $36.50, gross ton, at tidewater, for 6 and 8 inch, and $35.50 for 12-inch upward.

Finished Iron and Steel.—The American Bridge Company have booked orders since last report aggregating about 10,000 tons, consisting of numerous contracts in various sections of the country. The largest single contract was for 1800 tons for an annex to the Kaufman Building, at Pittsburgh. A great deal of tonnage is under negotiation. The strike of some of the employees of this company has not yet been settled. It is now in its seventh week. The prospects for its early settlement are much brighter. The Plate trade is quiet in this locality, as consumers will do nothing until May 1 wages settlements are made. A great deal of business is in sight and is expected to be closed as soon as the labor situation clears. A fair volume of business is reported in Bars. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates are 1.85c. to 2c. for Tank, 1.95c. for Flange, 2.05c. for Marine and 2.25c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.75c. to 1.90c.

Old Material.—Steel Scrap is strong, but the remainder of the list is decidedly dull, and prices show a declining tendency. Buyers are holding off, as a result of the recent developments in Southern Pig Iron. A sale of a round lot of Car Wheels was made at a price somewhat under that recently prevailing, indicating that this class of material is sympathizing with the general course of the Scrap market. A notable exception to the weakness in other lines is observed in Old Iron Rails, of which there are practically none in the market. Relaying Rails are lower. We quote, f.o.b. cars, vicinity New York, per gross ton, as follows:

Old Iron Rails	$24.50 to $25.00
Old Steel Rails, long lengths	21.50 to 21.75
Old Steel Rails, short pieces	19.25 to 19.50
Relaying Rails, heavy sections	26.00 to 27.00
Relaying Rails, lighter sections	26.00 to 27.00
Old Car Wheels	23.00 to 24.00
Old Iron Axles	30.50 to 31.00
Old Steel Car Axles	25.50 to 26.50
Heavy Melting Steel Scrap	19.25 to 19.50
No. 1 Railroad Wrought Scrap Iron	22.50 to 23.50
Iron Track Scrap	19.50 to 20.50
Wrought Pipe	15.50 to 16.00
Ordinary Light Iron	11.00 to 12.00
No. 1 Machinery Cast Scrap	19.00 to 20.00
Stove Plate	14.00 to 15.00
Wrought Turnings, delivered at mill	17.00 to 17.50
Cast Borings, delivered at mill	11.50 to 12.00

Metal Market.

NEW YORK, April 22, 1903.

Pig Tin.—The market has been very quiet. Buying for consumptive account was small, and little speculative interest was shown. In London prices were forced upward, but here they sagged. Demand from the interior was extremely quiet, but shipments were rather large, owing to deliveries against old contracts. The decline in prices here was steady throughout the week, and the metal was especially weak here for spot delivery, as the stock here, particularly in view of the recent heavy arrivals, is large. At this writing the London market is weaker than at any period of the last week, owing to lack of support from this side. Quotations here for spot to June ranged from 29.50c. to 29.70c. London closed £136 10s. for spot and £135 17s. 6d. for futures. Arrivals thus far this month amount to 2675 tons, and the afloats are footed to 3939 tons.

Copper.—The situation is unchanged. Producers are maintaining nominal prices and consumers are not buying. Even the metal is second hands, which is offered at prices considerably below the producers' figures, is not taken. There have been offers of Lake Copper during the week as low as 14⅛c., but no buyers could be found. To-day a well-known metal broker offered to sell a certain brand of Lake in either large or small lots at 14¼c., but his attempt was not successful. The producers' prices are unchanged from last week, being 15c. to 15¼c. for Lake and Electrolytic, and 14½c. to 14¾c. for Casting. These figures are quoted on

'Change as "nominal." The London market scored a heavy decline during the week. Prices to-day, as compared with those of a week ago, show a falling off of £1 12s. 6d. To-day's cables name £61 7s. 6d. for both spot and futures. The London decline is said to have been caused by the increase in the European visible supply, which the fortnightly statistics show to have grown 1450 tons. The comparative statement of apparent consumption of Copper in the United Kingdom, as per Board of Trade Returns, shows:

Stocks, January 1	1903.	1902.
London, Liverpool and Swansea	11,270	15,340
Imports January to March 31	30,947	50,391
Totals	42,217	65,731
Exports same period	16,096	17,309
	26,121	48,422
Stock, March 31, London, Liverpool and Swansea	7,010	19,050
Apparent consumption for three months.	19,111	29,372

The imports this month were especially large, amounting to 2900 tons. Included were Chile from Europe and direct; Japanese direct and Australian via Europe. A revision of the list of brands of Lake Copper constituting "good delivery" on contracts made in the New York Metal Exchange, was made to take effect April 27. The revised list includes the following brands: Adventure, Arnold, Atlantic, Calumet and Hecla, Centennial, Franklin, Mass Consolidated, Michigan, Osceola, Phœnix, Quincy, Tamarack, Wolverine.

Pig Lead.—No change in prices here is to be noted, although there was a heavy decline in London. The drop there amounts to £1 5s., as compared with the price ruling when the American Company advanced their prices. This decline amounts to just 30 points, or as much as the last advance in price made by the American Company. The official price here is 4.65c. for 15 days' delivery and 4.67c. for spot. London is quoted £12 10s.

Spelter.—The market has been quiet and steady at 5.70c. for spot and 5.60c. shipments. St. Louis is unchanged at 5.40c., and London has advanced 5 shillings, to £22 15s.

Antimony.—Cookson's is quoted 8.25c. to 8.50c.; Hallett's, 7c., and other brands, 6.75c.

Nickel.—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

Quicksilver—Has advanced to $47.50 per flask of 76½ lbs. in lots of 50 flasks or more. London is unchanged at £8 12s. 6d.

Tin Plate.—There is no change. Business is fair. The price of the American Tin Plate Company is based on $3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, and $3.99 New York delivery.

The business of the Walter A. Zelnicker Supply Company in St. Louis has grown to large proportions. They are now establishing a branch at Seattle, Wash., where a full stock of railway, mill and factory supplies will be carried. They have also established an office at 503 Binz Building, Houston, Texas, in charge of H. E. Miller, and an office at room 5, Providence Building, Savannah, Ga., in charge of Mell A. Collins. A. H. Crausby, formerly with Berlin Machine Works, is now representing the Walter A. Zelnicker Supply Company in Arkansas. Geo. G. Huncken is now representing them in North and South Carolina, C. M. Butin in Indiana and Ohio, Adam Young in Illinois. Herbert L. Schamberg will have charge of the railroad and large factory trade in the East. W. H. West, formerly sales manager of A. Leschen & Sons Wire Rope Company, will be in charge of the Seattle office.

The Employers' Federation alluded to in the report of the Committee on Resolutions at the meeting of the National Manufacturers' Association at New Orleans has become a fact in Omaha. On Tuesday the Business Men's Association of Omaha gave to the press a statement showing that more than 800 had banded to fight the labor organizations, each pledging himself to assist any member who had trouble with his employees. The publication of the statement has caused great comment among the labor unions, and a special meeting of the Central Labor Union has been called to discuss the matter.

The Ambridge Club, composed of engineers and draftsmen in the employ of the American Bridge Company at their new plant at Ambridge, Pa., about 20 miles from Pittsburgh, have applied for a charter. It is the intention to build a club house at Ambridge for the use of the members.

PERSONAL.

W. R. Beatty, formerly in charge of the wagon hardware department of the Oliver Iron & Steel Company at Pittsburgh, has resigned to accept a responsible position with the New Castle Forge & Bolt Company, at New Castle, Pa. Mr. Beatty was presented by his former workmen with a very handsome watch.

The statement that G. H. Duggan had been appointed general manager of the Dominion Iron & Steel Company of Sydney, N. S., as made last week, was incorrect. Mr. Duggan is third vice-president of the company and owing to the resignation of the second vice-president has now assumed his duties. The general manager is David Baker.

H. M. Brittan, formerly general superintendent of the Pacific works of the American Steel & Wire Company, has recently been appointed general superintendent of the Pacific Steel & Wire Company, San Francisco, Cal.

R. C. Berkeley has been engaged as contracting engineer for the Pacific Coast by the Minneapolis Steel & Machinery Company of Minneapolis, Minn., and will be located at 191 Crocker Building, San Francisco.

L. E. Cochran, president of the Youngstown Iron, Sheet & Roofing Company, at Youngstown, Ohio, and also connected with other industries at that place, has returned from an extensive trip to the West Indies, Jamaica, Cuba and Mexico.

H. R. Fothergill has resigned as manager of the Philadelphia office of Chas. Dreifus & Co., taking effect May 1, and has connected himself with the Delaware Suburban Railway Company of Wilmington, Del., as general manager and chief engineer.

Robt. S. Groves, who has been many years connected with the iron and steel trades, has accepted a position with the Worth Bros. Company of Coatesville, Pa., and will be in charge of their Philadelphia offices in the Arcade Building, Fifteenth and Market streets.

Andrew Carnegie sails for England this week.

C. C. Schneider, vice-president, in charge of the engineering department of the American Bridge Company, has resigned, but at the request of the company will retain connections in a consulting capacity.

Chicago Employers' Association.

The Employers' Association of Chicago through its secretary has made public the aims and objects of the organization, the statement being in answer to the unjust criticisms which have appeared publicly, and which appear to have been born of ignorance.

The Employers' Association, it should be kept in mind, represents every mercantile interest in the city of Chicago, and is not opposed to organized labor as such. The association was organized to defend and protect the business interests of the city, and to that end to bring employer and employee into closer and harmonious relationship. There is no discrimination against union labor, nor against nonunion labor, for that matter. The association seeks to secure to employers and employees alike freedom of contract in the matter of employment. It opposes restraint of output and is against sympathetic strikes and boycotts. It endeavors to prevent interference with persons seeking to work and to earn a living. It endeavors to avert industrial disturbances of all kinds, and favors arbitration as a means of settling disputes between employer and employee.

These sentiments recognize that there is no natural antagonism between an employer and his workingman. It must be evident to all thinking men that whatever tends to peace and prosperity in the industrial world is as much desired by the employer as the employee, but coercion which seems to be the labor unions' most potent and often used weapon does not tend to better the condition of any one. Secretary Job, in defining the Employers' Association of Chicago, tersely says: "The association is a business proposition."

The Pennsylvania Steel Company.

At the annual meeting of the Pennsylvania Steel Company on Tuesday, 21st inst., the retiring directors were re-elected. President E. C. Felton, in his report, says in part:

During the year the Pennsylvania Steel Company of Pennsylvania completed their purchase of certain interests in the Cornwall ore banks, near Lebanon, Pa., and now own 40-96 of that property, with a two-third interest in the Cornwall and Lebanon Railroad, and two modern blast furnaces at Lebanon. Bonds of the Pennsylvania Steel Company, specifically secured by mortgage on these properties, were issued on October 1 last, to the amount of $7,500,000, to pay for them and for by-product coke ovens to be erected at Lebanon.

The Juragua Iron Company, Limited, and the Spanish-American Iron Company produced during the year 575,460 tons of iron ore (one-half the product of the Juragua Company being included), an increase of 140,667 tons over the previous year. The new line of railroad to the Berraco Mines, about eight miles in length, which the Spanish-American Company has been building, is practically completed, and the first ore from the new mines reached by it was shipped in February. The entire cost of this railroad and the development of the mines connected with it have been charged off to Depreciation Account. Your entire interest in the Cuban Steel Ore Company, amounting to $347,900, has been charged off to Profit and Loss.

The Pennsylvania Steel Company of Pennsylvania made during the year less pig iron than in 1901, though the capacity of its blast furnaces was fully 25 per cent. greater than in the previous year. Its production of steel was about 5 per cent. greater than in 1901, the increase being entirely in the open hearth grade. Its Bessemer plant was shut down 13½ per cent. of the working days of the year owing to shortage of pig iron supply. The Maryland Steel Company made during the year almost the same output of pig iron and steel as in the previous year, although its blast furnaces had a capacity for making pig iron one-third greater than in 1901. Its steel making plant was idle 13 per cent. of the time owing to lack of pig iron, and much of the time while in operation produced less than two-thirds of its normal output.

The Maryland Steel Company have continued during the year the building of by-product coke ovens, which will have a capacity of about 1000 tons of coke a day, and will supply about three-fourths of the coke consumed by their blast furnaces. They have also improved and enlarged the equipment of their steel plant and rolling mills. They purchased during the year 500 steel coal cars, paying for them with an issue of $600,000 car trust certificates. The shipyard has increased the size of its launching ways and made other improvements. This department completed during the year two 12-ton twin screw freight steamships and three torpedo boat destroyers, and a large floating dry dock for the United States Government.

The Baltimore & Sparrows Point Railroad, the securities of which are owned by the Pennsylvania Steel Company, was successfully operated during the year. The double tracking of its line and bridges was completed, the cost of these improvements being charged to operating expense.

The end of the year finds the plants of all of these subsidiary companies in excellent condition and capable of producing a much larger output than during 1902. It is expected, however, that profits will be reduced owing to the very considerable advances which have taken place in the cost of fuel and in freight rates. No important additions or improvements are at present in contemplation other than the building of by-product coke ovens at Lebanon; these will cost about $800,000, which amount is in hand for the purpose.

The operating companies owned have, after paying interest on bonded indebtedness, and after charging to general and special depreciation $1,522,481, earned, net, $2,473,532, out of which this company received in dividends $1,177,500, and the balance, $1,296,031, has been retained by the operating companies for additions to plant and to working capital.

In addition to the $820,085 charged to general depreciation by the operating companies, the sum of $713,396 was charged into their costs of manufacture. This amount was spent either for permanent improvements or charged as a special depreciation to particular departments or to railroad equipment.

The Profit and Loss Account for the fiscal year ended December 31 is as follows:

		Increase.
Net earnings	$3,690,864	$811,591
Other income	274,187	*49,372
Total income	$3,965,051	$762,219
Interest on bonds and debt	671,434	121,320
Net income	$3,293,617	$640,899
Depreciation	820,085	328,874
Balance	$2,473,532	$312,025
Dividends paid to Pennsylvania Steel Company of New Jersey	1,177,500	26,750
Surplus	$1,296,032	$285,275

* Decrease.

The Indiana Weekly Payment Decision.

Attorney-General Chas. W. Miller of Indiana has decided to take an appeal to the United States Supreme Court against the State Supreme Court's decision that the weekly wage law of that State is unconstitutional. Ordinarily the action of the State Supreme Court is final in cases where the State constitution is interpreted, and the United States Supreme Court has frequently refused to permit appeals in these cases, but in this case Attorney-General Miller says that a Federal question is also involved because the Court holds that there has been a violation of "the Fourteenth Amendment to the Federal Constitution, denying a State the power to deprive a person of life, liberty and property without due process of law."

The action of the highest court will be watched by many other States that have enacted laws for the weekly or bi-weekly payment of wages. L. P. McCormack, Indiana's Labor Commissioner, designates the State Supreme Court's decision as a "death blow to labor." The following legal points are made prominent in the decision:

"The only rational grounds upon which it is claimed there may be legislative interference with freedom of contract for lawful purposes is in the exercise of the police power. It is not to be invoked to protect one class of citizens against another unless for the real protection of society in general. When the power is used for the purpose of regulating a business occupation or employment, which in itself is lawful and useful to the community it becomes the duty of the Court to decide whether the particular regulation is just and reasonable or an unwarrantable invasion of the protected rights of the citizen to pursue such business or employment upon terms of his own choosing.

"The contract affects employer and employee alike. If the master can employ only upon terms of weekly payment, the workman can find employment on no other terms. The statute gives the parties no choice. The laborer may be the chief sufferer. By this law he is denied the right to work, and another the right to employ him, unless he can be paid once a week. Any law or policy that disables a citizen from making a contract whereby he may find lawful, needed and satisfactory employment is unreasonable.

"The statute places the wage earners of the State under quasi guardianship. It classes them with minors and other persons under legal disability by making their contracts void at the pleasure of a public officer. It tends to degrade them as public citizens by impeaching their ability to take care of themselves. It is paternalism pure and simple and in violent conflict with the liberality and equality theory of our institutions."

The public officer referred to in the concluding paragraph is the chief labor inspector of the State, who was empowered by the law to bring suit in the name of the State against anyone refusing to comply with the law within ten days after the payment of wages "is due and left unpaid." The penalty for violation was judgment for the amount with 6 per cent. from the time payment was due, and an assessment of 50 per cent. of the amount for the benefit of the school fund.

HARDWARE.

EVERY jobbing house finds in the course of its business that merchants who have for years been customers have gradually diminished their purchases almost to the vanishing point, as they have been growing stronger and more successful. From the early stage of a limited business, when practically all purchases were made from the jobbers, there has been a development and progress until the country storekeeper with a mixed stock has become a prosperous merchant in a vigorous town, doing a large business and branching out as a jobber covering local territory. The wholesale house with whom he has established relations shares up to a certain point the benefit of this growth and success. When, however, the business attains a certain importance the merchant is more and more brought into close relations with the manufacturer in various lines, if not in all, and as little by little the merchant purchases one kind of goods after another from the manufacturer it is at the expense of the jobber, who becomes gradually the channel through whom only an insignificant part of the stock is bought. By and by such customers practically disappear and often become competitors.

This condition and tendency furnish the broad minded and farsighted jobber one of the problems which must receive his best attention. This shifting of trade he must regard with regret, even though he cannot consistently complain, as the course of things occurring under his observation and to his detriment is probably only a repetition of the history of his own house. The problem which confronts him is how to hold such customers as long as possible. The right, and indeed the duty, of retail merchants to broaden and extend their business must, of course, be frankly conceded. An enterprising and flexible policy should be put into effect and consistently followed which will make it their interest not to seek prematurely or unnecessarily other sources of supply. While in the ordinary course of things with growing retail houses there will be year by year an increasing proportion of their goods obtained direct from manufacturers, the jobber who gives efficient service and attractive prices may hope for an indefinite time to reap benefit from their enlarging trade and growing prosperity, even though their success is such as to make them at last practically independent. The constantly increasing number of houses who are drawing their supplies directly from the manufacturers entitles this feature of the trade to a careful consideration.

In connection with the discussion which is being carried on in our columns in regard to methods of ascertaining and recording the costs of manufacturing Hardware products there are many indications that this is a subject upon which it is exceedingly desirable that all possible light be thrown, owing to the lack of attention which is too often given to it and the variety and perplexity of the problems which are presented in so wide a field. One manufacturer who, after a good deal of haphazard work, has at length arrived at good methods, refers to the fact that for a long time his estimated profits on various goods ranged from 15 to 200 per cent., while at the end of the year the balance on the right side was microscopic in its proportions. It is worth noting that houses whose methods are most carefully devised are apparently as much interested in the subject as any, inasmuch as they are constantly on the alert to find improvements in some part of their systems, and are therefore on the lookout for suggestions which they can derive from methods which in some respects perhaps are less perfect than their own. There is so much detail and variety in the treatment of the different goods as they vary in character and are made under widely different circumstances that information in regard to the ways in which some of the problems have been solved is of peculiar interest to those to whom it is a matter of prime importance to have good methods in this department. In its further discussion we invite suggestions and advices from all manufacturers.

Condition of Trade.

From all sections of the country reports indicate a continuance of trade conditions which have been prominent for some months. Demand equals, if not exceeds, that of the corresponding period of last year, and includes both staple and season goods. Difficulty is experienced in getting prompt shipments, owing both to the fact that factories are behind on orders and transportation facilities are not equal to the requirements. Goods are scarce in most all lines, but especially so in season goods, including Freezers, Screen Wire and Poultry Netting. Prices are exceedingly firm, with advancing tendencies in some lines.

Chicago.

(*By Telegraph.*)

It is interesting to note how closely the Hardware trade reflects conditions in agricultural districts. During the week, while the volume of business has been heavy, there being a liberal movement on orders previously placed, not a few of the local jobbers have noted a falling off in new orders, reflecting the period of wet weather experienced about ten days ago, and there is some speculation as to whether we are about to have last year's experience of a wet, late spring and early summer season repeated. The country reports that the plowing of corn is very backward, but the intention is to put in a large acreage if the farm work can be pushed, and with the more favorable weather conditions of the past few days this can be accomplished. In the Southern States corn is generally planted and started well, but oats seeding has been interrupted by rains. However, the bulk of the crop has been planted in that section with a full average acreage. The winter wheat situation continues highly favorable in every respect, although a lower temperature has been experienced recently. Up to the present time there is no apprehension in regard to the fly pest, the plant being already well advanced and able to withstand any ordinary attack. Salesmen canvassing for orders for Wire, Nails, Wire Fencing and other staple products meet with the general response, "Ship the orders already booked before asking us for additional tonnage," and this seems to be the spirit throughout the trade. Consumption is exceedingly large and the distribution liberal, yet mills are still far behind in deliveries on contracts and naturally new business is falling off. The demand continues largely for Steel Goods, Carpenters' Tools, especially Saws, Refrigerators, Lawn Mowers and other spring goods, while specialties are moving freely, but the call for fall goods is less active. The advance on Handles for Hammers, Hatchets, Axes, &c., which went into effect on Monday last, reflects the difficulty experienced by manufacturers in obtaining wood, not only because of the scarcity of the material, but the difficulty in getting labor, which is now employed in other directions. A stronger tone has been developed in Corrugated Sheets, which have been advanced 10 cents per square, and a firmer feeling is noted in Valley Tin. The merchant trade in Heavy Hardware, including Bars, Small Angles, Shapes, Washers, Bolts, Nuts and similar goods continues above the average. There is a fair current order trade experienced for Builders' Hardware, mainly on country orders, the city trade continuing relatively quiet. It is reported that there has been a turn in affairs in this line satisfactory to large dealers, although no change in the general prices current.

St. Louis.

(By Telegraph.)

Thus far April has been marked by a very high degree of demand in the Hardware market, and a most encouraging outlook seems to favor the market. Many lines continue very scarce, and it is said that this will particularly apply to Wire products. The demand for Bicycles, Sporting Goods, &c., is very pronounced. The call includes all seasonable lines, the heavy department of the market seems to be in a good healthy condition, and the volume of demand at this time is fairly large. Wagon and Carriage Hardware is in active call for this season. Prices in all departments of the market are generally firm and collections good.

NOTES ON PRICES.

Wire Nails.—The market continues strong, with so good a demand that difficulty is experienced at the mills in making prompt shipments on contract orders and new business. In fact, they are filled with orders for some time to come. Quotations are as follows:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.05
Retailers, less than carload lots	2.15

New York.—Local demand is fair, with a strong tone to the market. The volume of business is curtailed to some extent by labor troubles among the building trades. Quotations are closely adhered to, and are as follows: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—While the new contracts offering show some falling off from the previous pressure, there is a fair tonnage coming forward, and the difficulty still is in making shipments rather than in securing new business. The tone of the market is firm and prices remain unchanged. The jobbing trade has continued quite satisfactory, sales being made on the previous basis. Official prices are $2.15 to $2.20 in carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For Galvanizing 75 cents per keg and for Tinning $1.50 extra per keg is charged.

St. Louis, by Telegraph.—Wire Nails continue in active demand, and jobbers continue to quote $2.35 in small lots from store.

Pittsburgh.—The situation in the Wire Nail trade is very satisfactory, the mills having plenty of orders, and specifications on old contracts placed prior to the advance in prices are coming in very freely. There is some delay in getting prompt deliveries of Wire Nails, owing to the crowded condition of the mills and the scarcity of Steel. The car situation is now satisfactory, and there is very little trouble from this source. The tone of the market is firm, and we quote: Wire Nails, $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; for Galvanizing Nails 75 cents per keg is charged and for Tinning Nails $1.50 per keg extra.

Cut Nails.—A continued scarcity of Steel is causing a delay in shipments, but this is not so prominent a feature of the situation as for some time past. Demand is steady and of fair volume, with a strong market. Quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The local demand is steady, and in about the usual proportion to Wire Nails. Labor troubles are having an effect upon the volume of business. Quotations for carloads and less than carloads are as follows:

Carloads on dock	$2.29
Less than carloads on dock	2.33
Small lots from store	2.40

Chicago, by Telegraph.—The scarcity of Steel still interferes with the prompt filling of orders, but some independent mills have been in the market during the week offering to make early shipment, and upon this basis have taken some important orders. The general market, however, is without essential change and is strong in tone. Sales continue to be made on the basis of $2.30 in carload lots and $2.35 in less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

St. Louis, by Telegraph.—Jobbers report a very fair demand for Cut Nails, and quotations as before: Steel at $2.40 and Iron at $2.60.

Pittsburgh.—Manufacturers report a good, steady demand for Cut Nails, and are shipping their product as fast as made. There is still some trouble in getting Steel promptly, and this delays shipments to some extent. Prices are firm but without change, and we quote: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The mills are catching up with orders, and deliveries are consequently improving. Current demand is only fair. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—Although conditions are more favorable to the mills, they are still far behind in the filling of contracts, and new business, which is considerable, still adds to their embarrassment. A strong and confident tone continues without change in prices or any tendency toward a change at present. The jobbing trade has been fair; sales of Galvanized are being made on the basis of $2.75 to $2.80 in carload lots and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents additional is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

St. Louis, by Telegraph.—The movement of Barb Wire is very considerable. Jobbers continue to quote in small lots from store Painted at $2.65 and Galvanized at $2.95.

Pittsburgh.—There is nothing of special interest to note in the Barb Wire trade. New business is mostly in small lots, but the mills are busy on old contracts, specifications on which are coming in at a satisfactory rate. There is no change in prices, and we quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30, Galvanized, $2.60, in carloads to jobbers; Painted, $2.35, Galvanized, $2.65, in carloads to retailers; Painted, $2.45, Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—Recent orders have, to a considerable extent, been for small lots. Large contracts were placed some time ago, upon the filling of which mills have been employed. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	10	11	12&12½	13	14	15	16	
Base.	$0.05	.10	.15	.25	.35	.45	.55	Annealed.
$0.30	.35	.40	.45	.55	.65	1.05	1.15	Galvanized.

Chicago, by Telegraph.—Although the largest contracts have been placed the new tonnage is of proportions larger than usual, and the demand for Fencing is unusually active. Shipments are coming forward more rapidly, but the mills are still considerably behind on contracts. Local jobbers are experiencing a satisfactory trade and the market is firm. The following are the prices current: Nos. 6 to 9 on the basis of $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carloads from store, Galvanized bringing 30 cents extra for Nos. 6 to 14, and 60 cents extra for Nos. 15 and 16.

St. Louis, by Telegraph.—Plain Wire is very well sustained. Jobbers' quotations are unchanged: No. 9 at $2.30 and Galvanized at $2.60 in small lots from store.

Pittsburgh.—The market is firm, but orders are mostly for small lots, the large tonnage having been placed

some time since, and on which the mills are working steadily. Prices are firm and are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Handles.—An advance in the list price of Turned and Shaved Handles, including Hammer, Hatchet, Axe, &c., has been made by the manufacturers, the new list going into effect on April 20. The difficulty of obtaining suitable wood for Handles is becoming more pronounced each year.

Binder Twine.—During the past two weeks the Eastern market has undergone some changes. The price on Sisal and Standard Twine has been advanced ¼ cent per pound by some manufacturers. Some concerns are only accepting orders for small lots, having about sold their entire product up to June 1, while others are not accepting any new business. Demand is active, while the amount of Twine is limited, especially Sisal and Standard. Very few of the priceless orders taken before April 1, and guaranteed against International Harvester Company's prices, have been canceled. The quantity of available Twine is somewhat reduced, as some Eastern mills are under contract to make Twine for the combined companies in the West. The impression prevails to a considerable extent that a scarcity of Twine may result from an unusually early harvest. Quotations are as follows, f.o.b. Eastern mills, with ¼ cent per pound rebate in carload lots:

Sisal	10¼c. to 10½c.
Standard	10¼c. to 10½c.
Standard Manila (550 feet)	11c.
Manila (600 feet)	11¾c.
Pure Manila (650 feet)	12¾c.

Cordage.—Manufacturers of Rope are well employed filling orders now on hand. Quotations are as follows, on the basis of 7-16-inch and larger: Sisal Rope, according to quality, 8 to 10 cents; Manila, 11 to 11½ cents per pound.

Glass.—The demand in this market is light, but prices are represented as being well maintained, largely because there is so little business. It is anticipated that the jobbers' association will place another order some time during the month of May, for which they expect to have to pay an advance in prices. With most of the Glass factories closed and practically no outside competition, manufacturers will only be limited in advances by the prices jobbers are willing to pay. It is probable that several small advances will be made before new Glass reaches the market in the fall or winter. Quotations of the jobbers' association, for either single or double strength, are as follows:

	Discount.
From store	90 and 10 %
F.o.b. factory, carload lots	90 and 20 and 2½ %
F.o.b. factory, 2000-box lots	90 and 25 %

Paints and Colors.—*Leads.*—The unfavorable weather and labor difficulties among the building trades have affected the demand for White Lead in Oil. While there is some weakness in the Pig Lead market, manufacturers have made no change in prices of White Lead in Oil, which are as follows: For 12 tons and over, 6¾ cents per pound, less ¼ cent rebate and the usual 2 per cent. for cash. In lots of 500 pounds and over, 6¾ cents per pound, and 2 per cent. for cash. In lots of less than 500 pounds, 7¼ cents per pound, net.

Oils.—*Linseed Oil.*—Demand continues to be for small lots, with a somewhat weak market. This is due to the lower prices of Seed and the large stocks on hand at Western distributing points. City Raw, in lots of five barrels or more, is quoted at 44 cents, and out of town brands of Raw at 42 cents per gallon.

Spirits Turpentine.—Business at this point is confined to small lots. Stocks are increasing and large buyers are not placing orders, owing to the uncertainty of the market's future. Quotations, according to quantity, are as follows: Southerns, 51 to 51½ cents; machine made barrels, 51½ to 52 cents per gallon.

SOUTHERN ILLINOIS CO-OPERATIVE HARDWARE BUYING ASSOCIATION.

AN organization has been effected, having its headquarters at Centralia, Ill., in which several Hardware houses are united for the purpose of joint purchase of goods. The following houses, all of whom are affiliated with the Illinois Retail Hardware Dealers' Association, are members of this buying association: O. B. Kurth and H. G. Cormick of Centralia; J. S. Bellamy & Co., Sandoval; Hinman & Mathews, Mount Vernon; Scheurer Bros., Nashville, and J. V. Vawter, Salem. Of this association O. B. Kurth is president and H. G. Cormick secretary and treasurer. It is anticipated that the active work of the organization will be conducted by the secretary-treasurer, through whom goods will be purchased.

Some significance attaches to this effort, as it is the outgrowth of the desire on the part of enterprising Hardware merchants to make use of co-operative buying so as to put them in a position to meet the troublesome competition of department stores and catalogue houses who often purchase goods at as low prices as the jobbers. While this association comprises but comparatively few houses, we understand that it is anticipated that others may become identified with it later. Mr. Cormick, the secretary-treasurer of the association, appears to be admirably qualified for the position he occupies, and is widely known, not only as a successful merchant but as the late president of the National Retail Hardware Dealers' Association.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Geo. H. Oetzel, successor to the A. H. Foster Company, Union, S. C., has added a metal roofing and plumbing department to his Hardware business.

G. S. Hayes & Son have purchased A Rosenberg's Hardware store in Gardner, Mass. They have added considerably to the former stock.

Hartwell Bros. have just established themselves in business at Cushing, O. T., handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

The Vivroux Hardware Company, Seguin, Texas, have been incorporated with a capital of $50,000. They succeed Vivroux & Son in the wholesale and retail business in Hardware, Stoves, Farming Implements, &c.

W. Glassford & Co. is the style of a new firm who have lately entered the Hardware, Stove, Paints and Oils and Sporting Goods business at Beavertown, Ont.

J. H. Wakefield has recently embarked in business at Eagle City, O. T., handling a line of Shelf Hardware and Furniture.

Articles have been filed changing the name of the Nelson & Bouquet Hardware Company, Minneapolis, Minn., to the Nelson-Bouquet-Holliday Hardware Company, J. P. Holliday having been admitted as a member and elected treasurer. The capital stock has been increased and the company have moved to new and larger quarters at 217-221 Third street, North, until recently occupied by Bement-Darling Company, jobbers of Agricultural Implements. The building is five stories and basement and will afford almost double the floor space of the former quarters.

Foot, Stone & Rogers Company, Fremont, Neb., have been incorporated, with a capital stock of $15,000, to carry on the Hardware, Stove, Paints and Oils and Sporting Goods business formerly conducted by Jno. J. Cloos.

HARDWARE STORE WINDOW DISPLAY.

BY J. H. WYNN.

A GREAT mistake in window displays is in not making frequent changes. If a window is let run too long the goods get dingy, dust accumulates and gives the window and goods a very dirty and shop worn appearance and consequently fails to attract attention. The writer has made it a rule not to let the window display run longer than three weeks and generally to change it every two weeks. If one only cleans the goods and places the same articles back but differently arranged it gives the window a new appearance. For instance, if John Jones or Wm. Smith, as the case may be, puts on a new suit of clothes how quickly it is noticed. But had he gone on wearing the same old suit day in and day out no one's attention would have been attracted. So it is with the window. If it is changed often people stop to look it over and by so doing become interested.

POINT GOODS RIGHT.

A mistake is often made by window decorators in arranging goods by looking at them from the inside of the store and not from the outside of the window. For instance, tools, such as Hammers, Screwdrivers, Saws and such articles, should be placed with the handles pointing toward the street, just as one would place them on the counter before a customer. Now no salesman would think of handing a Hammer to a customer for inspection by the head first instead of by the handle. Goods ought to be so arranged in the window that one could pick them up by the handle were the glass not there.

WINDOWS SELL GOODS.

An attractive show window is the best salesman a merchant can have, and many times a customer stops, looks at the window for a while, and then steps inside and says: "I would like to purchase a Ratchet Screwdriver, such as I see in your window." Thus this sale is actually made before the customer enters the store, and all it requires in this case is a boy to wrap the article up for him. Once inside a person generally sees something else he needs. One-half the battle is to get people in the store.

Some time ago a letter was received from a party at Boston saying "Please send me C. O. D. an Electric Night Lamp, such as I saw in your window the other night." Now, here was a case where the window made the sale while the clerks were probably all in dreamland. No one could rob the window of that sale. Many sales are made in the same way.

Desiring to increase the sales in Cutlery the writer made an exhibit on a revolving disk 12 inches in diameter and 48 inches high. This was placed on the walk near the window. The result was that during the display the sales in the line shown were doubled, comparison being made by weeks. What did this but the display?

LINES TO BE SHOWN.

One can make the best display with tools and sample boards of Builders' Hardware. Tools nicely arranged are always attractive. One should not overcrowd a window, and the putting in of a full line of one article and none of the other does not do very well. The writer generally makes a selection of a few of each line so as to have many lines of goods displayed. One always wants to keep in mind what articles should be brought before the public and display them a few weeks in advance.

Do not place in the window much Shelf Hardware, Sash Cord, Cans of Glue, &c., for most people know that such articles are to be had in every Hardware store. Such valuable space as a window should be put to better use.

In the fall one can display a good deal of Cutlery in the way of Carving Sets for Thanksgiving and gradually increase in Carvers and later on add Skates, Traveling Sets, Leather Goods, Plated Table Ware, Tools, Tool Chests and Novelties for the Christmas trade.

The first change following Christmas is the hardest display to make to attract attention, for it is just between seasons. Fill the window with Hardware and Tools making a complete change from the Christmas display and interest people in seemingly a new window.

Begin in March to build up the spring, displaying Golf Goods, Seeds, Paints, Varnishes, Paint and Varnish Brushes, Tools, Garden Sets, Rakes, Hoes, Spades, Pruning Saws and Knives, Budding Knives, Builders' and Cabinet Hardware, Lanterns, Fishing Tackle, Guns, Ammunition, Lawn Mowers, Grass Hooks and Bathroom Fittings. Of course this line would not do for every Hardware store, for some do not handle Golf Goods, but nearly every dealer carries the rest.

In a few weeks' time one would have to withdraw Seeds, Lawn Mowers, Garden Sets and Grass Hooks, but the rest could be used nearly all through the summer in making the display.

Selecting goods for a window one wants to use those with the best finish and of latest design and place these most seasonable in the most prominent part of the window.

PROTECTING GOODS IN THE WINDOW.

Great care wants to be taken of goods used for display, not allowing them to remain in the window long enough to become shop worn. By so doing one can always have a fine display and at no loss of money. A display window can be made a very expensive thing if goods are allowed to become injured in any way. A window should be made as near dust proof as possible, and when a window display is once finished close it up and do not allow it to be opened until next change takes place, for one cannot keep a neat and clean window by allowing every one to throw open the sash and go in and haul out goods at his own will. The disarrangement of a few articles will make a window look as though the goods intended for display had been thrown in, instead of being artistically arranged, and this done it loses its attraction for the public.

MARKING PRICES.

A mistake is made in not at times putting prices on some of the goods. By this it is not meant that every article should be marked, for this makes a window look cheap. Prices should be taken out entirely for one or two displays and then put back in again. Marking prices in plain figures on goods displayed certainly brings customers into the store. Not so long ago about one-third of the goods in the window were marked in plain figures on a round tag of 1-inch diameter. Among those marked were some Planes. During the display a chance customer came and said:

"I would like to see one of those Planes you have in the Window marked 88 cents." It was shown him. He looked it over carefully, taking some time to do so. After adjusting his eyeglasses several times he looked up and said:

"Why this is a genuine Stanley Plane, is it not?"

I answered, "Yes, sir; it is."

"Is that the right price, 88 cents?" asked he.

"Yes, that is right."

"Well, I'll take that Plane. Why I can remember when we had to pay $1.25 for just such a Plane. I had no idea I could purchase such an article in this vicinity for that money."

He not only took the Plane, but purchased several other articles and has been a steady buyer ever since. Had it not been for the price on that Plane the man would probably have passed on, still maintaining the idea that it was a high priced house, and he would probably have bought elsewhere.

This pricing of goods in the window is much better than newspaper advertising because hundreds of people pass by one's place of business and see these goods marked, whereas probably only a few would read the advertisement in the paper. Of course, if one has a Hardware store in the country, then advertise in a town or county paper; but for a city firm to advertise in such a paper would only be a bill of expense.

A DISPLAY OF TOOLS.

What does for one display will not suit another. So a person wants to give his window deep study and use his own judgment as to what is best to display. A dark green or a black material, if not too expensive a grade,

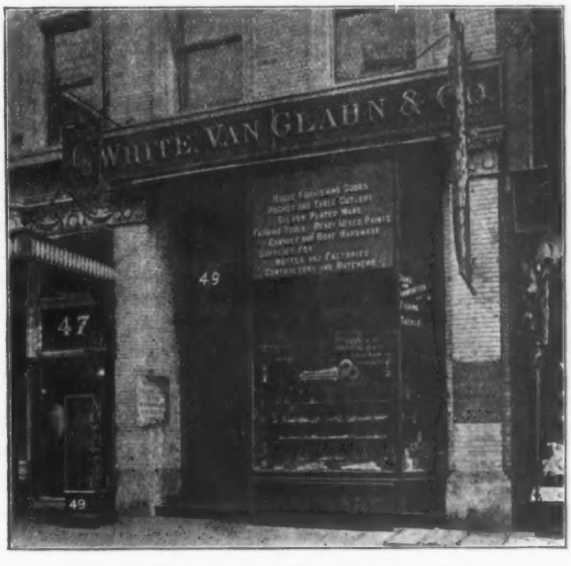
makes a good covering for the floor of a window. When displaying Tools one should use a platform and have it slope slightly to the front. On this platform it is well to use a nickel plated stand to hold four glass shelves. On these shelves make a display of Builders' Hardware sample boards and mounted Locks and Knobs on blocks. In each corner use nickel plated swinging brackets and on these brackets hang Lanterns, Razor Strops, Skates, Dog Collars, Golf Bags, Thermometers and such goods as could be hung up. For a background use three sample boards covered with the same material as the platform and on these boards arrange a series of Tools, say, on one Wrenches, Gas Pliers, Pipe Cutters, Stock and Die, &c.; on another Hammers, Screw Drivers, Saws, Steel Squares, Levels, Auger Bits and Chisels; on another, and use this one as a center piece, Brass Door Chains, Coat and Hat Hooks, Barrel Bolts, Door Knockers, Drawer Pulls, Coppered Turns, Drop Handles, &c. These boards should reach half way to top of the window and from the top for a background for the upper half would hang Shovels, Forks, Spades, Garden Rakes and Hoes.

LIGHTING.

One thing that is greatly overlooked in a display window is the lighting. A row of lights should be run along the top and sides of window with reflectors to throw the light down upon the goods. These should be so arranged so as to permit two or three lights to be kept burning all night. Thus the window may be lit up and properly displayed after the place of business is closed for the day.

A WINDOW.

As before stated, what will do for one store will not suit another. A window trimmer has to use a great deal of care and study out his own display so as to suit his class of trade best. The accompanying illustration



shows the writer's window with a Tool display in the foreground. The window is very hard to arrange, as it is much wider at back than at the front. Thousands of people pass the place of business every day and one has to have a general display of Hardware, Sporting Goods, Cutlery and Novelties. The base is covered with a dark brown velour, and on this is a platform of oak covered with same material, leaving a space of 12 inches on each side and along front of the window. The base is 3 inches higher at back, so as to have goods displayed on a slight incline.

A GOOD SPRING WINDOW.

A display made up as described below was prepared last spring by the writer: On the front space were shown Golf Balls, Drivers, Brassies and Iron Clubs. These were brought to the front, as this was at the beginning of the golf season. On the right-hand side was placed a line of Paints, Varnishes and Brushes, and on the left Flower and Vegetable Seeds. On the outer corner there are three nickel plated swinging brackets on each side of the window, on which were hung Conductors' Lanterns, Chandelier Thermometers, Razor Strops and Dog Collars. Upon the platform stood a nickel plated stand of two uprights which holds four glass shelves 12 inches wide and 60 inches long. On the lower three shelves were displayed sample boards of Builders' Hardware, mounted Locks on blocks and Letter Boxes. On the top shelf were placed Traveling Bags and Dress Suit Cases.

Upon the platform underneath the glass shelves were arranged a center piece with a display of different kinds of Hammers, laid fan shape, with Auger Bits and Screwdrivers lying in between them. To the left of this was shown Boat Hardware and Bicycle Supplies. To the right were Chisels, Try Squares and a small Anvil with Riveting Hammer and Tools of various kinds. In the rear were placed loaded Shells and Cartridges. To the right of these glass shelves stood a nickel plated upright holding three round glass shelves. The top shelf measured 12 inches in diameter, the middle one 18 inches and the bottom 24 inches. On the top shelf were displayed Call and Hand Bells. On the middle one nickel plated Match Stands and Bottle Holders, and on the bottom one leather goods, such as Pocketbooks, Card Cases and Change Trays. On the left side a similar stand held on the top shelf nickel plated Alcohol Lamps for tourists, on the center one different kinds of Whisky Flasks (empty), and on the bottom one Revolver and Chamois Revolver Cases.

In both back corners of the window are swinging brackets, such as are used in the front, and on these were hung Golf Bags. The background consisted of a curtain 30 inches high made of the same material as the covering of the base. It was fastened by rings to a pole which runs the length of the window; back of these are two sliding sash, which when closed makes the window nearly dust proof. Hanging in the back of the window and on the sides were six cards, about 10 x 12 inches, nicely marked "Golf Goods," "Fishing Tackle," "Lawn Mowers," "Grass and Vegetable Seeds," "Ready Mixed Paints" and "Garden Tools," calling the attention of the people that such goods were carried in stock.

LORING COES' NINETY-FIRST BIRTHDAY.

LORING COES of Worcester, Mass., inventor of the Screw Wrench and head of the Coes Wrench Company and Loring Coes & Co., Incorporated, manufacturers of Machine Knives and Wrenches, celebrated his ninety-first birthday yesterday, April 22. Mr. Coes is in his usual vigorous health, and is almost as active in the business as ever. He has received scores of congratulatory letters and messages from all over the country, besides the greetings of many neighbors and friends in Worcester. In connection with the event a monograph has been issued, entitled "A Bit of History of Loring Coes, and His Connection with the Screw Wrench," in which an interesting story of Mr. Coes' business career is presented. It is stated that while Mr. Coes was not actually connected with the making of the first American Wrench, he was the maker and patentee of the first Screw Wrench that could be adjusted with the hand that held it. The company are also sending out to their friends and customers fine portraits of Mr. Coes and his grandson, Frank L. Coes, who is secretary and manager of the Coes Wrench Company, which will doubtless be highly valued by those who receive them. Mr. Coes is probably the oldest active manufacturer in the Hardware trade, and will have their best wishes for many more years of usefulness.

The Peirson Hardware Company, Pittsfield, Mass., have been incorporated with a capital stock of $30,000. The officers are Henry R. Peirson, president; Frank E. Peirson, treasurer, and Kenneth B. Ritchie, clerk. The business to which the company are successors was established by George N. Dutton in 1853, the late Henry M Peirson becoming a partner in 1857. Mr. Dutton continued until 1876, when Henry R. Peirson bought his interest. Frank E. Peirson came into the firm in 1892, two years prior to the death of Henry M. Peirson. The company do a large and steadily expanding business.

HARDWARE FACTORY COST METHODS.

MANY aspects of the general question as to proper methods of getting at the cost of goods are touched upon in the letters given below from manufacturers. Most of them relate to the inquiry in a communication published in our columns as to the principle on which nonproductive labor and expense should be charged up against goods, and in reply a number of suggestions, together with more or less definite information as to plans which are successfully used, are contained in the extracts which we present. These express in a direct and businesslike way the views of manufactuers, some of whom have given careful and even laborious attention to the subject, and thus embody the experience of years. The conciseness with which the subject is presented and the variety of practical suggestions given justify the careful perusal of these interesting advices:

PLAN FOR DISTRIBUTING NONPRODUCTIVE COST.

We are indebted to well-known manufacturers in Ohio for the following clear statement of their method of distributing nonproductive cost over the various products of the factory:

Divide the factory into three general departments:

THE ADMINISTRATIVE, including the Office, Accounting Department, Purchasing Department, Sales Departments, &c.

SUPERINTENDENT'S DEPARTMENT, including the Superintendent, Production Department, Warehouses, Pattern Shop, Tool Department, General Repair Department, Plumbers, Electricians, &c.

MANUFACTURING DEPARTMENTS, including all the branches in which the product regularly sold is manufactured.

DISTRIBUTING NONPRODUCTIVE COST.

The entire Superintendent's Department is nonproductive labor, and all the material used adds to the expense of the factory. Determine what this amounts to for a given time, and divide the figure by the number of productive hours. This will give a rate per hour per producer for general expense.

Then find the cost of the nonproductive labor and material in each of the departments. Divide the expense for each manufacturing department by the productive hours of that department, and thus determine a rate per productive hour for departmental expense.

If to this figure be added the actual rate of pay per hour, the total cost of labor will be determined. In case the operative is paid on the basis of the number of pieces manufactured, his expense rate per hour is not affected.

This cost must be added to the piece work price to determine the labor cost of the article.

When the material cost and the factory labor cost have been added together the total factory cost is the result. Ascertain what percentage the administrative expense bears to the total cost of the product, and add this percentage to every factory cost.

This method has some objections when the product is varied as to cost of material, but is very nearly correct for any line of goods where the material used is of about the same value per unit.

LETTERS FROM MANUFACTURERS ON FACTORY COST METHODS.

From a New Hampshire Manufacturer: In the article on page 65 of *The Iron Age* April 2 we note the definition of productive and nonproductive labor, which places the man carrying work from one department to another as nonproductive—*i. e.*, does not advance the work toward completion. It might be suggested that carrying work from one machine to another is bringing the work toward completion, as without such labor it would never advance toward completion at all. Why not say that the man who tends a machine belongs to the nonproducing class, as it is the machine only that advances the work toward completion?

Productive or Nonproductive

From a Manufacturer in Ohio: The articles on factory costs must be interesting and useful to your readers. The foundation of every moderate size or large size business is the cost of product. The manner of keeping costs naturally differs with the character of the industry. In some instances the work is done by contracts or jobs, in others by day labor altogether, and in many shops in part by each of the two plans. In some instances one contractor or boss will take the material and carry it to a certain condition for a certain price per dozen, gross ton or other ways of measuring, as the case may be. Then another contractor will take the material from that stage of process and carry it further, possibly to completion, or possibly between these two contracts there may be some day labor. In any event if the manufacturer will begin at the starting point and follow through carefully and gradually each and every process, record labor, fuel, use of machines, use of forges, including blast and fire brick, if the article is ground provide not only for the labor, but for the emery, glue and wear of the wheel, or for the grit in case the grinding is done on stones, adding everything as he goes along, he will find, after a system is once established, that it is a simple matter to figure cost. For convenience he might omit the cost of material, showing its weight, however, and then add that in at the end or at any intermediate stage, governed by the market price of material at such time or date as he wants to know the cost. In many instances a finished article is composed of two or more important parts. This system can be carried out in each one of these parts up to the stage when they are to be put together either in the process or in the final assembling. I find that where manufacturers have not figured cost they regard the matter as an insurmountable task. Every man is not fitted for such work, but there are plenty of men in any industry who can easily figure costs after a little study. The value of the knowledge is fully equal to the expenditure to obtain it.

Contract System

Elements of Cost

Various Methods

On the market I fear more to contend against the man who guesses at or has no knowledge of his cost than I do any half dozen who possess the information. I am not aware that there is anything new or novel in my method of computing costs. It is well adapted to our industry.

From Manufacturers of Refrigerators: Replying to the Hardware manufacturers' inquiry "as to the basis on which nonproductive costs should be charged up against goods and the description of our cost system," will say in our factory we do not recognize that there is any such thing as nonproductive costs. All factory costs with us are productive costs, because they enter into the cost of the goods produced. The wages of the superintendent, foremen, engineer, firemen, filers, cleaners, watchmen, the cost of lubrication and incidental factory expense, &c., are all just as much productive costs as the wages of the man who assembles or puts on the finishing touches.

Do Not Recognize Nonproductive Costs

In writing on the subject of factory costs I shall confine myself to the personal experience in our class of goods only—viz., Refrigerators. Every different class of goods must necessarily be figured by different methods, based on the kind of goods manufactured and the factory and labor conditions governing each.

Material and Labor

Refrigerators are manufactured in lots of 100 to 2000 of a kind at one run, all of the same general style and finish. It is not a difficult proposition to estimate the cost of all materials entering into the construction of each separate style or size. Labor is divided into two classes—day work and piece work. In making an estimate the piece labor cost is as easily got at as the material cost. The day labor cost, however, must necessarily be estimated on the basis of the total day work pay roll per day, divided by the estimated output of each different style or size, based on the experience of the past. In the same way the incidental daily factory expense must be apportioned to the style or size of Refrigerator being estimated.

Verifying Cost Records

This gives us only an estimate. The all important question is the proof of its accuracy. The day labor item and the cutting waste are items that must be closely watched by the foremen of each department to see that the maximum quantity is produced with the minimum of expense and waste. The item of labor should be proved each pay day by a comparison of the actual pay roll with the estimated labor cost of the goods produced during the pay roll period, and a comparison made between the estimated labor and actual labor cost per superficial foot of goods produced so as to furnish statistics for future estimate. At the end of the season, after the inventory is taken and the amount of material actually used and the incidental factory expense ascertained, the comparison should be made as against the estimated cost of all goods manufactured during the season. There should also be made a comparison of the lumber actually used with the estimated lumber required to produce the goods manufactured during the season, thus establishing the proper percentage of waste for confirmation or correction of future estimates.

Meaning of Factory Cost

All factories must make estimates of cost before the actual costs are known. The important factor in estimate work is to afterward prove its accuracy or inaccuracy, so as to correct future estimate work. Under this system the estimated cost is proved at the end of each pay day period as regards the labor item, and as far as possible the material used based on estimated amount used. At the end of the season a further proof is taken based on actual output and cost, distributing cost by percentages among the different factory departments. By factory cost is meant the cost of goods delivered to the warehouse, exclusive of factory depreciation, interest, taxes, losses, office and general expense, cost of selling, &c. These, together with the dividends, must be provided for in the selling price of the goods and is a subject separate from the factory cost.

From Manufacturers in Pennsylvania: We do not have a system on which to base the nonproductive cost for goods. While the writer has been in the manufacturing business for upward of 25 years, we have never yet come across one that was entirely satisfactory and do not think there has been one made, or can be made, for such miscellaneous articles as ours, as some goods would take a larger percentage than others, according as the cost of raw material is in a larger proportion in one article than another. We are a small institution, and rather than go to the expense, or adding to the percentage of general expense, or overhead charges, as some people call it, by having an additional clerk, whenever required to figure up the cost of a certain article we have guessed at the percentage of general expense. We notice an item in *The Iron Age* of last week where a certain manufacturer was in as much doubt as we have been by saying the general expense would be somewhere from 33 1-3 to 50 per cent. Our system, in a nutshell, is to make the goods good, as economically as possible, and get all we can for them within reason, at or above cost, basing our general expense at from 1-3 to 50 per cent.

Difficulties in Distributing General Expenses

COST RECORD FOR REFERENCE.

A large manufacturer in Connecticut making a diversified line of goods has a staff of cost estimators, who by means of time slips, piece work records, &c., ascertain and record the cost of making the various articles, including, of course, the material. This record is contained in books having the regulation journal ruling. The name of the kind of goods concerned in the record is placed at the top of the page, then one line is used for each of the operations performed, as shown in Fig. 1. In the first of the two sets of the columns ruled for dollars and cents

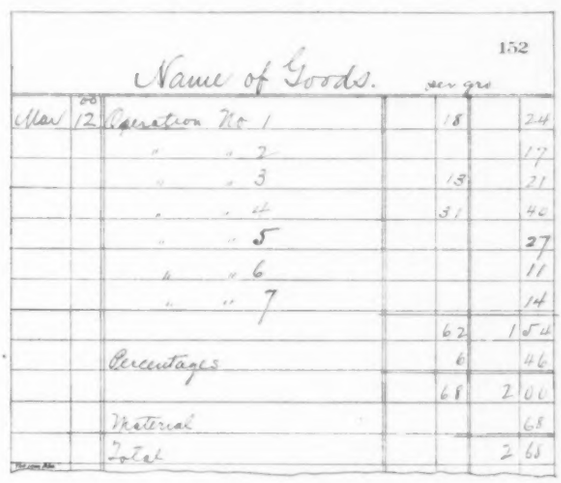


Fig. 1.—Page of Estimate Book.

is placed the cost of the material used in that operation. In the second column on the same line is placed the cost of the labor. Thus in operation No. 1, the material for one gross of the articles cost 18 cents and the labor 24 cents. When the record has been made of the cost of material and labor for each operation, the columns are footed up and to the material is added a certain small percentage and to the labor a larger percentage to cover the proportion of general expenses which the goods should bear. These percentages are determined from previous experiences and records.

When the cost of an article has been figured it is transferred to the card shown in Fig. 2, which is kept in the office in a card index for ready reference. On the

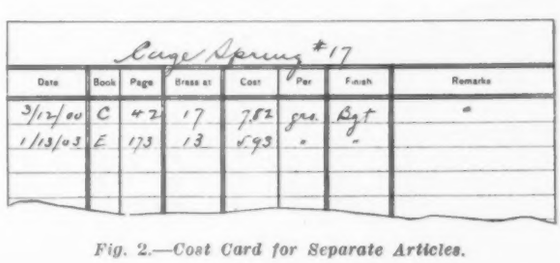


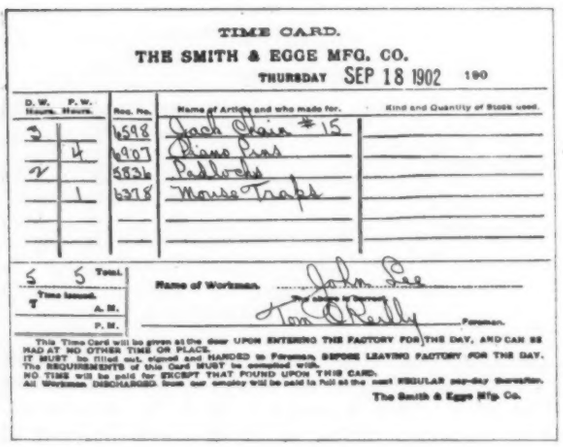
Fig. 2.—Cost Card for Separate Articles.

top line is written the name of the article estimated on. On the first blank line below is placed, under the proper headings, the date, the book and page in which the cost record is kept, the price of brass (it being the principal material employed), the estimated cost for a given quantity (the quantity to be noted on the card), the finish of the goods, and remarks, if any. When the cost department thinks it is time to make another estimate a new one is made and the result recorded on the same card. It also frequently happens that some one in the office wants later information regarding the cost of a certain line and ask for a new estimate. It will be seen that in this way the results of the different estimates are continually kept. By comparison of these costs from time to time interesting facts regarding the varying costs of turning out any line of goods can be observed. If more detailed information is desired than given on the cards reference can be made to the estimate books.

OUTLINE OF COST SYSTEM.

We give below a description of part of the system employed by Smith & Egge Mfg. Company, Bridgeport, Conn., which will be of interest as illustrating a method which has been carefully devised and found satisfactory in practical working. An important part of their business is the manufacture of special goods to order, and the form given below shows the manner in which account is kept of the labor cost of executing such orders, each of which when received at the office is given a requisition number which follows the goods called for through all the different factory operations.

The men in the factory are employed both at day and piece work. Every morning each workman receives a time card such as is shown in the accompanying illustration, and during the day fills out the number of hours he has spent on each order, stating, as is shown, whether it be on day or piece work, the time entries being put in the first two columns. In the next column is placed the requisition number, in the next the name of the article,


TIME CARD.

THE SMITH & EGGE MFG. CO.

THURSDAY SEP 18 1902 190

D. W. Hours.	P. W. Hours.	Req. No.	Name of Article and who made for.	Kind and Quantity of Stock used.
3		6598	Jack Plane #15	
	4	6907	Plane Iron	
2		5826	Padlocks	
	1	6378	Mouse Trap	

5 5 Total.

Time Issued. A. M. P. M.

Name of Workman. John Doe

Name of Foreman. Tom O'Reilly Foreman.

This Time Card will be given at the door UPON ENTERING THE FACTORY FOR THE DAY, AND CAN BE HAD AT NO OTHER TIME OR PLACE.
IT MUST be filled out, signed and HANDED to Foreman BEFORE LEAVING FACTORY FOR THE DAY.
The REQUIREMENTS of this Card MUST be complied with.
NO TIME will be paid for EXCEPT THAT FOUND UPON THIS CARD.
All Workmen DISCHARGED from our employ will be paid in full at the next REGULAR pay-day thereafter.

The Smith & Egge Mfg. Co.

Time Card, Reduced; Actual Size 7 x 5½ Inches.

and in the last is a space for notes regarding the kind and quality of stock used. These time slips are required to be turned in each day to the foreman, and upon approval by him are sent to the office, where the cost of the day's work is charged against the respective requisition numbers. From the reports thus received from the foreman the orders are also charged with the amount of piece work.

SYSTEM FOR KEEPING TRACK OF MATERIAL USED.

The orders having been duly entered at the office and given each its requisition number, they are turned over to the superintendent of the factory for execution, and on receipt of the requisition he draws an order on the stock room for the material required. This order, of course, bears the requisition number. The stock clerk delivers the material required and then sends to the office a slip stating the amount of material which has been delivered to the superintendent on account of requisition No. ——.

The cost of the material taken from the stock room is then charged in the office against the order. The scrap from the work and the unused material are returned to the stock room, weighed up, and the office is advised by the clerk of the quantity returned, and the value of this is credited to the account of the order. When completed the goods are sent to the inspecting room, where they are carefully examined before shipment.

When the order is completed the cost of the goods covered by the requisition is figured up in the office. Against the goods are charged the material taken from the stock room and the labor cost, whether time work or piece work. On the other side are credited the value of materials returned to the stock room and the value of the waste. The difference between the debits and credits is found, and to this is added the proper percentage to cover the fixed charges, such as rent, insurance, interest on investment, wear and tear, supplies, office expenses, &c. The figure thus obtained represents the cost of manufacturing the goods, to which is added the desired profit.

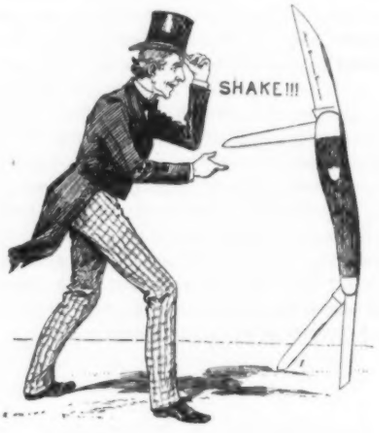
A weekly memorandum is sent to the office giving the amount of goods finished each day of the past week on each requisition. By comparison of these with the record of the amount of stock used any shortage in the finished product can readily be found, as it is known that a given amount of stock should make a certain amount of product and leave a certain amount of scrap.

DEATH OF JOHN TREDWAY.

JOHN TREDWAY, treasurer of the A. Tredway & Sons Hardware Company, Dubuque, Iowa, died at his home Monday, April 13. Mr. Tredway was born in Dubuque, September 11, 1863, and was the son of Alfred Tredway, one of the pioneers in the Hardware trade of Iowa. He was educated in the Dubuque public schools and began his business career as a clerk with the firm of Andrew Tredway & Sons. In 1889 he joined his brothers, Alfred W. and Harry E., in incorporating the A. Tredway & Sons Hardware Company, and had since been connected with that corporation as treasurer. Mr. Tredway had been an active factor in the jobbing Hardware business in Iowa, not only in his capacity as a member of the A. Tredway & Sons Hardware Company, but also as a stockholder in the Heavy Hardware business of the John Ernsdorff Iron Company. In 1888 Mr. Tredway was married to Fanny Henion, who, with one daughter, survives him.

A HARDWARE WELCOME.

ONE of the Pueblo daily papers in a reference to the meeting which was recently held in that city, at which an association of Colorado retail Hardware merchants was formed, used a cut, from which the accompanying illustration is reproduced, to indicate the welcome which awaited the visitors at the hands of the



A Hardware Welcome.

local merchants and the public generally. It is to be hoped, however, that while the handshake was a hearty one, it was not quite so clean cut as the artist has metaphorically suggested.

The F. Hersh Hardware Company, Allentown, Pa., have been incorporated with a capital stock of $150,000, and will continue the wholesale and retail business in Shelf and Heavy Hardware, Paints and Oils, Sporting Goods, Iron and Steel and Photographic Supplies. Henry D. Hersh, George T. Hersh, Arnold R. Lewis and Daniel L. Kistler are the principals.

Hughson & Littlejohn, Clyde, N. Y., have dissolved, Richard Littlejohn having purchased Mr. Hughson's interest. The business will be continued under the firm name of A. & R. Littlejohn. The business is principally plumbing and heating, but Builders' Hardware, House Furnishing Goods, Tinware, &c., are also handled.

THE TRAVELING SALESMAN HIS METHODS AND CONTROL

BY SAMUEL MASTERS.

CHAPTER XV.—ADVANTAGES AND DISADVANTAGES OF HAVING SALESMEN COLLECTORS.

IT is, of course, understood that in this second method maps are used as in the first, and the field reports are made regularly, independent of the collection blanks. In fact, whatever other features may be introduced in the systematic covering of territory by salesmen the maps and reports should be used and carefully kept corrected to date. These show the ground covered, by whom and how often, and form the basis for other details.

Induces Prompt Payment.

A man upon the ground can do more in a conversation than can often be effected in the course of a long correspondence concerning a matter in doubt. If the customer knows that the man who calls upon him will have authority to settle matters he will hold them in abeyance until the salesman calls and thus many of the obstructions to business that occur under other conditions never appear. Disputed claims never grow old through neglect to make report, and there is no excuse for delay in settlement.

In the instances where this method is used the salesmen are in general required to cover their territory every two weeks. Thus there is but little time given beyond the ten days that usually marks the termination of the discount period, provided the customer pays promptly; and with a limit set upon his purchases, based upon the amount of his indebtedness, he will pay promptly if he desires to keep an account with the jobber. This he usually desires to do, for the houses whose men make collections and who use a modification of the system outlined are among the largest in the country, with private brands which have an established reputation and with an enviable record for prompt shipment of orders. A house not in good standing with the trade could not so successfully put such a plan in operation.

Time Saved in the House.

This method means considerable extra work for the bookkeepers and men of accounts, but it saves more time in the collection of accounts than is consumed in carrying the scheme along. When the route sheet shows that the salesman is due at a town within a few days the proper slips are given to the bookkeepers, who write in the amounts of sales, unpaid bills and account past due, if any. Then the slips go to the credit man, or whoever has charge of the matter of collections, and he notes on the slip the cipher instructions to the salesman, supplementing these, when necessary, with letters giving instructions which are not covered by the cipher. It is not a long job for either the bookkeeper or credit man to run through slips where accounts are normal. In many instances more than two weeks will have elapsed since an entry was made upon the ledger, and a repetition of former footings covers the case; if the account is an active one, no more than a half dozen entries will have been made, and unless there is trouble the bookkeeper's work is slight. If there is anything about the account which requires special attention he can lay the facts before the credit man, who can instruct the salesman accordingly.

Corrects Customers' Errors.

Any one who knows anything of the vast amount of detail involved in the collection of accounts in a jobbing house will agree that a plan which will do away with any portion of it is of value. In the ordinary office there is a great deal of annoyance and correspondence caused by simple carelessness and neglect on the customers' part—neglect to remit when due, cash discounts improperly figured, deduction made with no intelligible reason for doing so and a neglect to either explain or remit when requested. Interest charges are ignored, accounts let run beyond a reasonable time and drafts allowed to go back dishonored with remark "Have sent check" when no check has been mailed. Besides, there is the dealer who brags of the standing he has with the jobbers from whom he buys and measures it by the amount they will let him owe. There is a tiresome sameness to the business, a wearying repetition of the same annoying discrepancies, and the credit man's letters become a stereotyped collection of standard phrases, politely worded, but cold and formal in their tone, and not always calculated to excite friendly feelings for the writer. When this feature of the business is transacted through the salesman the cold formality is expended upon the sales slips or blanks, and the salesman relieves this feature of the business of much of the unpleasantness.

Benefit to Sales Manager.

When the credit man has finished his work upon the slips they should go to the sales manager to be sent out with the day's mail to the salesman. He has thus an opportunity to look them over and to know how matters stand with the house's customers—a matter of importance to him. If the account is waning and the sales do not nearly approach the limit he can urge the salesman to increased effort, or a letter to the customer inquiring the reason for the falling off in the amount of business can often be written in a way to draw forth a greater amount of trade. The sales manager has also thus knowledge of the credit man's steps to collect and if need be can interpose to save trouble and keep a customer. If the sales limit is unnecessarily low and the salesman is needlessly restricted he can perhaps secure an increase in the amount permitted to be sold.

Sales Limit.

The fixing of a sales limit is simply a step added to the reducing to definite terms of the capacity of the territory as indicated in the compilation of lists of dealers with rates and credit rulings. In this instance the credit man can fix a limited liability upon the different firms in keejing with their capital and credit, and many firms whom he would not be willing to enroll among the eligibles on an unlimited basis he can thus admit to the list by reducing the limit, and by watching the payments as noted on the blanks protect his house against too great an indebtedness or one of too long standing. One of the houses using such a system sells Cutlery, Table Silver Ware, Sporting Goods, Bicycles and Saddlery, and the salesmen visit in many towns jewelers, druggists and Sporting Goods men with limited means. The adoption of a credit limit, coupled with personal collections, makes it comparatively safe to sell to such a trade these lines that pay an unusually attractive profit.

Added Security.

By adding definiteness the plan gives an additional sense of security to all who come in contact with it. The salesman knows just how far he can go in his sales; the credit man and the sales manager have at short intervals a synopsis of each account laid before them for inspection and can guard against losses through overloaded accounts; the customer learns that he must pay promptly to insure good standing with the house and usually discounts his bills when the salesman calls as a matter of course, and the drawback clerk finds that he is able to clear up matters coming to him with much less trouble. The advantages of the system are many and obvious. The disadvantages are chiefly in adding to the detail work of the jobber's office a system requiring constant attention and in adding to the salesman's duties the labor of making collections—and both of these disadvantages have compensating features that more than offset them. There is more work saved in the detail of collections and credits as transacted under the old system than is created in the new, and the salesman's influence and importance and consequent ability to sell are sufficiently hightened to pay him well for the trouble of making collections.

N. A. GLADDING, vice-president and secretary of E. C. Atkins & Co., Indianapolis, Ind., has been appointed as one of the commissioners from Indiana to the Louisiana Purchase Exposition and World's Fair, to be held in St. Louis, 1904.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., April 9, 1903.

The Quarter's Hardware Trade.

DURING the past three months I have repeatedly pointed out that British Hardware manufacturers were being saved by their export trade. The complete returns for the first three months' foreign trading are now to hand, and they bear out my expectations. For the three months ended March 31 the British exports of iron and steel manufactures reached £7,533,635, an increase on last year of £1,444,886. Of other metals and manufactures thereof the total reached £1,639,139, an increase of £107,874. Of Cutlery, Hardware, Implements and Instruments, the total was £1,084,000, an increase of £77,000 on last year. Machinery increased by £415,000, but telegraph cables and apparatus declined by £408,000. Looking more closely into the details of the lighter section of these exports the following figures show clearly enough the countries upon which we have depended for this increased trade and the amount thereof:

British Exports of Cutlery.

	Three months ended March 31, 1901.	1902.	1903.
To Russia	£287	£967	£261
Sweden	81	85	78
Norway	553	418	230
Germany	4,171	3,845	4,028
Holland	434	159	434
Belgium	1,144	705	585
France	887	493	442
Spain and Canaries	138	660	780
United States	21,521	17,892	23,471
Foreign West Indies	1,433	1,611	672
Chile	2,994	3,396	4,053
Brazil	7,014	6,528	8,996
Argentine Republic	3,847	2,711	2,594
British South Africa	19,743	29,886	36,487
British East Indies	15,723	14,687	16,054
Australia	36,191	27,240	16,472
New Zealand	6,123	5,462	4,671
Canada	10,035	10,994	16,623
Other countries	23,612	19,162	22,991
Totals	£155,931	£146,901	£159,922

Hardware (Unenumerated).

	Three months ended March 31, 1901.	1902.	1903.
To Russia	£13,655	£13,109	£8,643
Sweden	5,294	4,744	5,105
Norway	5,979	4,794	4,276
Germany	26,080	22,365	20,116
Holland	22,699	22,135	13,749
Belgium	14,763	13,556	13,932
France	5,737	5,308	5,754
Spain and Canaries	4,603	4,644	7,452
United States	9,349	13,626	9,302
Foreign West Indies	6,150	3,207	2,733
Chile	6,201	5,970	5,461
Brazil	5,974	5,634	9,601
Argentine Republic	7,214	5,967	4,555
British South Africa	35,668	44,178	79,371
British East Indies	43,511	47,153	47,207
Australia	65,347	43,389	42,372
New Zealand	18,323	18,210	16,070
Canada	5,631	6,836	6,752
Other countries	69,142	74,456	77,244
Totals	£371,320	£359,281	£379,695
Implements and Tools and parts thereof	364,685	357,427	394,401
Instruments and Apparatus, Surgical, Anatomical and Scientific	126,105	119,766	132,022

Galvanized and Corrugated Sheets.

	Three months ended March 31, 1901.	1902.	1903.
To Germany	£21,766	£15,466	£14,856
Dutch East Indies	12,015	18,355	16,277
Philippine Islands	13,153	11,657	21,696
Foreign West Indies	8,239	9,656	8,057
Mexico	16,058	18,113	27,540
Central America	6,808	6,119	3,029
Chile	22,251	7,254	13,577
Uruguay	11,054	12,206	10,494
Argentine Republic	100,903	27,059	77,953
British South Africa	58,227	184,754	188,196
British East Indies	171,201	194,626	213,003
Australia	194,051	196,224	123,068
Canada	5,562	15,511	13,058
New Zealand	31,307	41,753	61,587
Other countries	123,969	177,449	265,855
Totals	£796,564	£936,202	£1,058,240

Tinned Plates and Tinned Sheets (Iron or Steel).

	Three months ended March 31, 1901.	1902.	1903.
To Russia	£88,746	£109,149	£111,792
Germany	42,920	44,191	66,853
Holland	57,194	69,766	53,567
France	65,994	35,817	51,731
United States	135,490	276,726	211,585
British East Indies	105,326	86,397	86,022
Australia	55,663	62,598	45,103
Canada	33,781	59,902	71,272
Other countries	258,109	297,844	344,340
Totals	£843,223	£1,042,290	£1,042,265

So much for exported metal manufactures. During the quarter Great Britain imported the following goods to the stated values:

	Three months ended March 31, 1901.	1902.	1903.
Cutlery	£7,077	£6,066	£7,701
Hardware, unenumerated	234,371	311,085	341,585
Scientific Instruments (other than Electrical)	128,029	171,057	201,392
Clocks: From Belgium	£65,124	£60,251	£52,885
France	18,490	14,622	16,597
United States	24,006	17,989	15,645
Other countries	10,931	9,073	12,102
Totals	£118,551	£101,935	£97,229
Sewing Machines	85,960	85,943	102,192
Furniture and Cabinet Ware, House Frames, Fittings and Joiners' Work	274,310	227,396	159,002 101,740

These figures are interesting as showing activity in foreign markets. The real meaning of them is not so apparent. It almost invariably happens that when a home market declines there is increased activity in exports, and I cannot help thinking that to some extent it is dull trade at home which accounts for these large increases in foreign trade. That the home market is slack I have no doubt. Last week end I spent in a small English country town, the chief industry of which is market gardening. There is also a large carriage factory and a motor car works. In conversation with the leading ironmonger of the town he told me he had not known trade so bad for years. Asked the reason, he said he thought it was largely accounted for by the heavy taxation, particularly the income tax. In conversation with the proprietor of the carriage factory, he told me that, while he was selling fairly well, yet he could not get in his money, and that financial stringency was doing serious injury to trade. Asked as to his reasons, he said that no doubt heavy taxation had something to do with it, but that was an industry which suffered acutely from the after effects of war. Large numbers of young officers, he explained to me, on going to South Africa took with them all their surplus cash, with a consequent monetary tightness upon their return last year. Thus it will be seen that the South African War, while officially costing £250,000,000, in reality cost a stupendous sum in addition—a sum which no man can calculate.

South African Trade.

The following note by Henry Birchenough, a trade commissioner to South Africa, on the prospects in South Africa for agricultural implements, should be read with interest by American exporters:

I think the agricultural development of the Orange River Colony is likely to be very striking as soon as the series of railway extensions, which are now under consideration, are carried out. It is the colony which has suffered most from the war. There has practically been a clean sweep of agricultural implements and machinery. The farmers will have to start again from the beginning. As they are by nature extremely conservative, I am assured they will continue to use and reorder for many years to come the types of machinery and implements they now adopt. It is very important, therefore, that British manufacturers of all kinds of agricultural implements should make a push to secure their share of the trade at this really critical moment. If they allow their American competitors to take too large a part now they will have infinite difficulty in dislodging them in the future. I wish to make it quite clear that the Orange River Colony and the Transvaal are at the present time making a fresh start—with practically a clean sheet so far as the farming appliances are concerned. I do not overlook the fact that the "repatriation" officers of the two Governments are supplying immediate and most pressing needs. These measures are at best only provisional, and must leave a very large field for the enterprise of private traders.

As a guide to manufacturers and exporters let me

point out that the majority of farmers in the Orange River Colony will for some time be very poor, even when the various compensation claims have been paid. They will be short of oxen, horses and labor, and for that reason will not be able to cultivate large tracts of land, such as warrant the use of expensive and elaborate machinery. They will, however, require farm tools of all kinds—Light Plows, Harrows, small dairy plants, &c. Heavy Plows are useless, as the farmers will not for some time have oxen to work them. The Americans, as is well known, have obtained the strongest possible hold upon this branch of trade. They have been assisted by the fact that the agricultural problems they have had to solve at home are in many respects similar to those the South African farmer has to face, so that their manufacturers are better prepared at the outset to meet the South African demand. Still, there seems to be no reason why British manufacturers, if they will study the agricultural conditions of the country, should not be able to compete successfully with their American rivals. Now is the time to be on the alert and to lay themselves out to meet the demand which will assuredly accompany the coming agricultural development of the Orange River Colony and the Transvaal. If they let slip this opportunity I fear it is not likely to recur.

Openings in Natal.

The following are a few comments from an interview with A. K. T. Bulkley, a well-known Durban importer, who at the present moment is in this country. Speaking first of building materials, he said:

British manufacturers were formerly very backward in their efforts to secure trade in the colonies, but they are now much better. Still, in many ways, they might do more than they do to assist their agents in South Africa. British manufacturers are constitutionally conservative, but it is a hopeful sign that the conviction is making way that modifications in methods must be initiated. This improved attitude has been helped by the fact that whereas formerly they were pressed with orders, now the contrary is the case. Colonial trade in earlier years was also thought by them to be hardly worth the having, but this opinion has undergone a change, and now they are doing all they can to hold it. They have need for a lot of exertion to counteract the Americans and the Germans, who are making steady advances. For instance, Belgian and German cement, in large quantities, is landed in South Africa and sold at such rates as wholly to undersell the British article. England's business terms also are open to great improvement. Stocks at the coast have been heavy owing to the railway block, but lately they are getting cleared. British Ironmongery is well to the fore. English Paints can compete with all comers. Indeed, in all lines, if our manufacturers make up their minds so to do, they can have the bulk of the trade in South Africa. The lines we handle more particularly are specialties of the building trade, and we represent in Natal and the Transvaal such well-known firms as Waygood & Otis, for Lifts; George Jennings, Ltd., for Sanitary and Lavatory Ware; Hobbs, Hart & Co., Limited, for Safes, Strong Room Doors, Locks, &c.; Craven, Dunnill & Co., Tiles and Mosaics; the Granite Silicon Plaster Company, Callender's Bitumen Damp Course and Sheeting, &c.

A. K. T. Bulkley says that the building trade is particularly brisk in most parts of South Africa, but is much hampered by labor strikes, which are constantly occurring. The fact is, the demand is so much greater than the supply that the men take things into their own hands and do as they like. With all the cry of poverty and want of labor in the home country, it seems to him that South Africa could give work to many thousands in the building trade alone. Bricklayers in Natal, when he left, were being paid $3.84 per day and demanding $4.30, and, what is more, were out on strike because they could not get it. Carpenters draw from $3.60 to $4.80; plasterers the same, while in the Transvaal wages range from 25 cents to $1.20 more all round.

Hardware and Tools Up Country.

The up country Hardwareman is busy at the present time supplying the requirements of farmers or prospectors who have returned empty after the war. The homestead has, of course, to be refurnished, and all goods appertaining thereto are in demand. Notwithstanding the large quantity of Fencing Wire imported during the war, the call for this is still large, one local firm near Kimberly recently securing a 25-mile order. Fencing Poles are, however, scarce and dear, and of course perishable, and there is an opening for cheap Iron Standards to the manufacturer who can supply them. Gold prospectors' tools, for which there is always a constant demand, are: Four-pound Hammers, ⅞-inch Steel Drills, Shovels, Picks and Wheelbarrows; also Pestles and Mortars and Prospectors' Pans. For repairing tools: A portable or stationary blacksmith's shop, comprising a Portable Forge, Anvil and the usual tools.

The Demand for Portable Houses.

Immense interest has been taken in South Africa in the transportable and transposable house exhibited recently in Cape Town by the inventor, A. Silbiger, who has received a letter from the Director of Public Works at Pretoria, offering to place at his disposal a piece of land where the merits of the building may be tested and reported upon. It is stated that orders and inquiries have been received in overwhelming numbers. As a matter of fact, any kind of building, even a "tin" shanty, is acceptable and welcomed, and much more so, of course, any special kind of structure which sets out to provide an increase in the minimum of comfort provided by these. Factors which at the present time make for the large sale of imported knock down buildings are the absolute insufficiency of existing house accommodation suitable for artisans, the scarcity and dearness of locally made as well as imported bricks and other builders' material, and also the difficulties connected with labor, the builders' workmen, both in Durban and Johannesburg, being at present on strike for advances on their already high scales of wages. In Johannesburg itself the Town Council were recently considering a resolution for themselves to build houses to supply the pressing public demand for accommodation; while at Pretoria, Bloemfontein, Potchefstroom and 20 other Transvaal and Orange River Colony towns the same state of things exists. Apart from the towns, the mining, rural and agricultural districts, in consequence of the destruction caused by the war and the cessation from industrial pursuits for so long, offer exceptional openings for pushing a lucrative trade in buildings which may be set up with only a minimum of skilled labor.

South African Cutlery and Hardware Consumption.

The extent of South Africa's consumption of Cutlery is somewhat difficult of estimation, owing to the defective methods followed in recording the shipments by the various customs authorities in that country. The imports of Cutlery are lumped together with those of Hardware, which, of course, comprise a variety of articles. The total imports of these two classes of goods last year probably amounted to about $7,500,000, toward which the United Kingdom contributed Cutlery valued at $674,000, and Hardware, $1,074,000, or a total of $1,748,000, which is only about one-fifth of the whole. America comes next in order, but its contribution for 1902 is not at present known; it was, however, undoubtedly a big advance on that of 1901, when its Cutlery and Hardware shipments totaled $670,000. Germany's quota last year was 5127 tons, contrasted with 2112 tons in 1901, no values being yet published, which shows the great progress that country is making in these lines, and the shipments are still increasing.

PHILPOTT & ARMSTRONG CHANGES.

S. V. ARMSTRONG, president of Philpott & Armstrong, 823 Market street, San Francisco, Cal., has sold his entire interest in that company, and after May 1 will no longer be identified with it. The business will be continued at the above address by C. H. Philpott and Sanford Plummer, who was formerly with Dunham, Carrigan & Hayden Company of San Francisco. Mr. Armstrong was formerly with C. M. McClung & Co., Knoxville, Tenn., going to Sargent & Co., New York, as a *protégé* of C. M. McClung, and succeeding eventually E. G. Bucknell as Sargent & Co.'s representative in the Southwestern States. After a few years of satisfactory work in that field he was transferred to the Pacific territory. After traveling for five years through the section west of Denver Mr. Armstrong organized the corporation of Philpott & Armstrong. The company have done a large business in San Francisco during the last four years and the prospects are considered satisfactory for continued success under the new management. Mr. Armstrong expects to visit the East soon and hopes to meet many old friends.

TRADE ITEMS.

C. E. JENNINGS & Co., 101 Reade street, New York, have taken over the representation of the National Specialty Mfg. Company's patented Hardware Specialties, made at the company's factory, Lehigh avenue and Third street, Philadelphia, Pa. The goods include lines of Coffee Mills, Measuring Faucets and Pumps, Fruit, Wine and Jelly Presses, Sausage Stuffers and Lard Presses, Tobacco Cutters, Detachable Meat Hooks and Meat and Food Choppers, which will be handled both for the domestic and export trade.

AT a recent meeting of the stockholders of the Stock Yards Paint Company, Chicago, the name of the corporation was changed to the Stock Yard Hardware & Paint Company.

THE business of the Acme Mfg. Company of Plantsville, Conn., has been absorbed by the Hurwood Mfg. Company, the change in ownership to go into effect May 1. The business, the manufacture of Tools, will be greatly enlarged, additional room having been obtained by the taking of a large two-story brick building near that formerly occupied by the Acme Company. The motive power will be electricity, and the building will be equipped with electric lights. In addition to the well-known Hurwood Tools manufactured by the company new lines will be added, among them a recently patented Box Joint Plier and something new in the way of a Ball Bearing Plier. Another new specialty will be a patented Double Claw Hammer. A new forge shop will be erected in the rear of the present building.

THE KANSAS CITY IMPLEMENT, VEHICLE AND HARDWARE CLUB held its regular monthly meeting and dinner at the Coates House, Kansas City, April 13. The subject of "Advertising" was discussed by F. W. A. Vesper, S. H. Snow and J. C. Trumbull. W. M. Halliday, manager of the Sattley Mfg. Company, presented a paper on "The Relation of the Manufacturer and Jobber to the Retailer." The club was presented, through the secretary, with a gavel by the Studebaker Bros. Mfg. Company. The next monthly meeting of the club will be held May 4.

E. C. ATKINS & Co., Saw and Saw Tool manufacturers, Indianapolis, Ind., have received cable advices from New Zealand that the championship in the sawing contest held on Easter Monday was won by the party using the Atkins Saw.

THE AMERICAN WIRE SCREEN HOLDER COMPANY, Oberlin, Ohio, have succeeded John Hosford, Monroeville, Ohio, in the manufacture of the American Wire Screen Holder, having purchased Mr. Hosford's patents and business. This device is intended to hold seven rolls of Wire of different widths, from 24 to 36 inches, and from 50 to 100 feet in length.

THE MARLBORO WRINGER COMPANY have been organized under the laws of the State of Maine with a capital stock of $10,000, and have commenced the manufacture of Wringers at Marlboro, Mass. The officers and directors are as follows: J. A. Cratty, president; William McNally, secretary; F. S. Rock, treasurer; E. R. Collins, P. H. Geary and J. T. Sheahan. The purpose of the company is to manufacture Mop Wringers, for which special claims are made as to workmanship, durability and simplicity of operation. The Wringer will be made of galvanized iron throughout.

THE STANLEY WORKS, 79 Chambers street, New York, have loaned to the Hardware Club, at the suggestion of one of its governors, a fine painting in oil of Peter McCartee, late vice-president of the Stanley Works and formerly president of the club. This portrait was painted by Harry I. Thompson of New Haven, Conn., together with one of F. T. Stanley and William H. Hart, the first and present presidents of the company, respectively. These portraits are intended for the directors' room in the New Britain factory. Mr. Thompson is known to fame as the artist who has painted the portraits of Connecticut's Governors, now in the capitol at Hartford.

THE ROLLMAN MFG. COMPANY, Mount Joy, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are direct representatives, have issued an envelope booklet, entitled "Kitchen Krinkles," devoted to their specialties, among which are Cherry Seeders, Meat Cutters and Food Choppers, Apple Cutters, Peach Stoners, &c. There are also a number of food recipes by Mrs. S. T. Rorer suitable for use in connection with the utensils referred to.

NEW CASTLE SHOVEL COMPANY, New Castle, Ind., whose plant has been closed since the middle of March on account of a serious mishap to machinery, is being reorganized. The capital stock will be increased and the capacity of the plant enlarged. We are advised that one of the largest wholesale Hardware houses in the country has become interested in the company. The concern expect to be in shape to place goods on the market by July 1, and will be ready to furnish a full line for the fall trade.

THE RETAIL HARDWARE DEALERS' MUTUAL FIRE INSURANCE COMPANY of Minnesota, M. S. Mathews, secretary, 323 Boston Block, Minneapolis, issue blotters in which attention is directed to the company and the prosperous business done by it during 1902, a brief statement of its financial condition being given. As the trade doubtless understand, this company were established by members of the Minnesota Hardware Association for the purpose of supplying cheap insurance to the membership.

PRICE-LISTS, CIRCULARS, &c.

THE PERFECTION METAL STAMPING & MFG. COMPANY, Cleveland, Ohio: Pamphlet devoted to the illustration and description of the company's Culver Perfection Emery Wheel Dresser.

THE MARKHAM AIR RIFLE COMPANY, Plymouth, Mich.: Illustrated price-list of the Markham Air Rifles. These are shown in six styles, also the King Popgun.

THE BELLEFONTAINE NOVELTY WORKS COMPANY, Bellefontaine, Ohio: Circulars illustrating and describing the Water Seal Bread Box and the improved Bread and Pastry Board.

THE J. B. FOOTE FOUNDRY COMPANY, Fredericktown, Ohio: Catalogue and net prices of Hollow Augers, Spoke Pointers, Saw Vises, Mechanics' Drills, File Handles, Folding Buggy Seats, Corn Shellers; farm, school and church Bells, &c.

THE FRIEND MFG. COMPANY, Gasport, N. Y.: The Friend Spraying Outfits. Catalogues illustrate and describe these outfits, including Hand and Gasoline Engines. A number of testimonials are also submitted.

THE PRESSED STEEL MFG. COMPANY, Philadelphia, Pa.: Illustrated catalogue of Knipe Patent Ball Bearings, Axle Box and Adjustable Nut.

THE LOVE MFG. COMPANY, Rockford, Ill.: Catalogue and price-list devoted to Iron Lift and Force Pumps, Iron, Brass and Brass Lined Cylinders, &c.

HARBER BROTHERS COMPANY, Bloomington, Ill.: Illustrated catalogue of Vehicles. This comprises a large range of goods in a variety of styles.

THE F. W. DEVOE & C. T. RAYNOLDS COMPANY, corner Fulton and William streets, New York, issue a priced catalogue of Paints, Varnishes, Brushes and supplies for painters and decorators manufactured by them. A portrait is given of William Post, the founder of the business in 1754. Illustrations show the original store at the corner of Water and Fletcher streets, where the business was carried on for 101 years, as well as their present offices and showrooms.

THE WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Catalogue No. 91, devoted to Builders' Hardware. This contains a line of builders' fine Hardware, Butts, Spring Hinges, Door Hangers, Bolts, Cupboard Catches, &c.

THE TURNER BRASS WORKS, Chicago, Ill.: Illustrated pamphlet devoted to the Turner Gasoline Bunsen Burner, Bunsen Light and Manyscope. These are used in connection with double jet Gasoline Torches.

THE ELECTRIC GAS LIGHTING COMPANY, Boston, Mass.: Eighteenth edition, four-department catalogue, including Electric Gas Lighting, Electric Batteries, Electric House Goods and Electric Light Supplies.

THE PERFECT SLIDING DOOR COMPANY, Bridgeport, Conn.; New York agency, 62 Reade street: Catalogue devoted to House Door Hangers, Buffer Noiseless Cushions, Sliding Door Locks and Sliding Door Structures.

THE ELASTIC TIP COMPANY, 370 Atlantic avenue, Boston, Mass.: Catalogue illustrating Soft Rubber Car Seat Bumpers, Car Sign or Ventilator Stick Rubbers, &c. The company also manufacture Rubber Tips and specialties, and Rubber Goods to order.

THE CLARK MFG. COMPANY, Buffalo, N. Y.: Catalogue devoted to illustrations and list prices of Clark's Blind Hinges, Stove Pipe Dampers, Shutter Hinges, Blind Hinges, Gate Hinges and Latches, Loose Pin Butts, Spring Hinges, Sash Pulleys, Sash Cord Irons, Stove Lid Lifters, Boiler Handles, Bed Fasteners, Shelf Supports, Sink Brackets, &c. Special attention is directed to the Eagle Blind Hinges No. 75, which require no lifting to unlock, and to a smaller pattern of St. Louis Gate Latches, designated as No. 8.

O. K. HARRY STEEL WORKS, St. Louis, Mo.: Illustrated catalogue devoted to Round Corrugated Galvanized Wagon Tank, Corrugated Tanks, Feed Cookers, Sheep Dipping Tanks, Ash and Garbage Cans, Cisterns, Awning Brackets, Fencing, Shipping Cans, Corrugated Roofing, &c.

FRANK WRIGHT, Cave Springs, Ga.: Catalogue and price-list of Fly Escapes and Fly Escape Screens. The Fly Escape is a device placed at the top of Screens, through which the flies leave the room.

THE LAMSON & SESSIONS COMPANY, Cleveland, Ohio: Catalogue and price-list of Screw Wrenches, Bolts, Nuts, Washers, Rivets, Stove and Chair Rods, Stove Scrapers, &c.

THE TIE COMPANY, Unadilla, N. Y.: Catalogue and circulars devoted to Holdfasts, which automatically tie a string or rope for any purpose. Illustrations show these goods put to a large variety of uses, among which a Corn Shock Tightener is prominent.

LIBBY, HARLOW & Co., 69 Pearl street, Boston, Mass.: Illustrated catalogue of Dog Collars, Harness, Blankets, Muzzles, Brushes and Combs, Collar Locks, Bells, Leaders, Chains, Whips, Whistles and Hardware for Dog Goods. Special attention is called to the firm's Patent Lock Buckles, which are used on their best goods. The catalogue will be furnished to the trade upon application.

THE PITTSBURG METER COMPANY, East Pittsburg, Pa.: Catalogue devoted to the Westinghouse Gas Meter and Westinghouse Proportional Gas Meter.

J. P. EUSTIS MFG. COMPANY, 92 North street, Boston, Mass.: Illustrated catalogue and price-list devoted to Bathroom Accessories made of brass, nickel plated.

PITTSBURG TOOL AND DROP FORGE COMPANY, Pittsburg, Pa.: Catalogue illustrating the Cheswick Brand of railroad and mining tools. These include Hammers, Claw Bars, Punches, Mauls, Chisels, Tamping Bars, Spike Pullers, Picks, Rail Tongs, &c.

THE BAKER, MCMILLEN COMPANY, Akron, Ohio: Catalogue illustrating Plain, Varnished, Shellacked and Enameled Knobs, Handles, Pail Woods, Glove and Stocking Darners, Tool Handles, Reed Ware and Baby Carriage Turnings. Special attention is called to the company's easel cards of three dozen Enameled Knobs with Bolts and Tin Washers for instant application to Tea and Coffee Pots.

THE FLORENCE MFG. COMPANY, Florence, Mass.: Illustrated catalogue devoted to Toilet Brushes, Mirrors, Combs, Trays, &c.

FARWELL, OZMUN, KIRK & Co., St. Paul, Minn.: Catalogue relating to Paints, Colors, Varnishes and Painters' Supplies.

LOUIS SACKS, Newark, N. J.: Catalogue No. 10, relating to Heel Plates, Shoe Repairing Supplies, Reversible Iron Stands, Lasts, Bootjacks, Foot Rests, Repairing Outfits, &c. The concern have recently fitted up a new plant.

THE BLUFFTON MFG. COMPANY, Bluffton, Ind.: Catalogue of Rotary Washing Machines, which are shown in various styles and shapes. They are made of Louisiana cypress and have copper bronze castings and hoops.

CHAS. E. MILLER, 97-101 Reade street, New York: Automobile Catalogue No. 5, devoted to Automobile, Motor Cycle and Bicycle Parts, Fittings, Sundries, Tools, Clothing, &c.

WILLIAM T. WOOD & Co., Arlington, Mass.: Circular devoted to their line of Summer Ice Tools. The circular is not intended, they state, to take the place of their annual catalogue, but merely as a supplement, and in it are shown a large variety of Chisels, Shavers, Tongs, Axes, Saws, Breakers, Scales, Picks, Runs, Skids, &c.

THE WALKER & EHRMAN MFG. COMPANY, 127-129 West Washington street, Chicago: Illustrated catalogue, together with a standard price-list of Milled Machine Screws. In addition to the regular goods shown in the pamphlet, of which a complete stock is carried, the manufacturers are prepared to make turned metal parts of every description from steel, iron or brass, and make a specialty of quoting upon goods made from sample or from drawings. Besides Milled Screws, Studs, Shoulder and Collar Screws, Taper, Collar and Shoulder Pins: Hanger Screws, Coupling Bolts, Boiler Patch Bolts, Cones, Cups, Nuts and Screws for Bicycles are manufactured. Illustrations are also given of various kinds of Taps which are manufactured and carried in stock.

THE IDEAL MFG. COMPANY, 18-30 West Randolph street, Chicago: Catalogue illustrating Sheet Metal and Wire Goods made for trunk and case makers. The sections illustrated are carried in stock, but are only a small proportion of the pieces manufactured. The company also manufacture Steel Dies, Tools and Presses for the manufacture of the sheet metal goods. Stock pieces illustrated in the catalogue are designed for Sample and Medicine Case Corners, Sample Case and Telescope Clamps, Handle Rings, Plates and Loops, Flat Corners, Dress Suit and Sample Case Bolts, Bottle Clips and Hinges in great variety suitable for Trunks and Cases of all descriptions.

THE BURTON HANDLE COMPANY, Burton, Ohio: Catalogues devoted to Bob Sleds, Revolving Horse Rakes, Plows, Cultivators, Hand Hay Rakes; Agricultural, Hammer, Hatchet, Sledge, Pick and Axe Handles; Whiffletrees, Tire Setters, Hammock Chairs, Hammers, Nut Crackers, Vegetable Mashers, Soap Dishes, Hatchets, Lemon Squeezers, &c.

AMONG THE HARDWARE TRADE.

The Pacific Hardware Company, Everett, Wash., have undergone a change of ownership, and the following are now the officers of the company: A. Kimberly, president; David Oswald, vice-president, treasurer and general manager, and W. W. Black, secretary. Mr. Kimberly is also treasurer of the Northern Lumber Company. The company carry on both a wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Mill Supplies, &c.

W. J. Clark & Co., lumbermen, have purchased the Hardware stock of Thurber & Christopher, Warrensburg, Mo., and will continue the Hardware, Stove, Agricultural Implement, Sporting Goods, Lumber, Lime, Cement and Building Material business under the style of The Clark Lumber & Hardware Company, which will be incorporated.

Montana Hardware Company, Miles City, Mont., successors to John S. Truscott, have been incorporated with a capital stock of $20,000. They will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

Mawhor & Gowdy have succeeded Puey & McDaniels in the Hardware business in Tabor, Iowa.

N. Estaque has succeeded McDonald & Vaughn in the Hardware and Furniture business in Morris, Minn.

Guinn & Boots, Wellston, O. T., have been succeeded by the King Hardware Company, who have been incor-

porated with a capital stock of $10,000; surplus, $3500. The company deal in Shelf and Heavy Hardware, Tinware, Stoves, Farming Implements, Harness, Buggies, Sporting Goods, &c.

Shallish & Rich in the Hardware business in Auburn, N. Y., have dissolved partnership. Hiram J. Rich has purchased the interest of Harry Shallish, and will continue the business under his own name at the old quarters.

Van Bockern & Harms have succeeded to the Hardware business formerly carried on by the Jim River Land Company in Lenox, S. D.

D. W. Forsyth, Cumberland, Ohio, who has carried on the Hardware business at that point for the past 37 years, has sold out to J. B. Beckett, who will continue at the old stand. Mr. Beckett will add materially to the stock, and will also carry a line of Paints, Oils, White Lead and Varnishes.

Margaret DeWolfe, St. Stephen, N. B., announces that she has purchased the interest of W. A. Dinsmore in the firm of DeWolfe & Dinsmore, and will continue the business under the management of her son, E. L. DeWolfe. The firm will be incorporated under the style of the DeWolfe Hardware Company as soon as letters patent can be issued.

H. M. Bailey, Sheffield, Ala., has just been succeeded by the Bailey-Donk Hardware Company, not incorporated. John Donk, who has been taken into partnership by Mr. Bailey, while a young man, has had about 10 years' experience in the Hardware business, having been for seven years with W. B. Belknap & Co. and for the last three years with the Simmons Hardware Company. Mr. Donk has severed his connection with the latter concern and will devote his entire attention to the business of the new firm. The working capital of the firm will be doubled, which will enable them to carry a much larger stock than has heretofore been the case. The lines carried will be the same as formerly handled by Mr. Bailey, only on a larger scale. They are the following: Shelf and Heavy Hardware, Stoves, Tinware, Glassware, Crockery, Sash and Doors, Window Glass, Lime, Cement, Plaster, Hair, Sewer Pipe, Oils, Varnishes, Brushes, Buggies, Wagons, Harness, Garden Tools, Farming Implements, Pipe Fittings, Grates, Mantels, Furnace and Plumbing Supplies, etc. Mr. Bailey's store was opened just a year ago, he having resigned as secretary of the Mayberry Hardware Company of Birmingham to go into business for himself. The jobbing business of the concern extends from Decatur on the east to Corinth, Miss., on the west, and from Mount Pleasant, Tenn., on the north to Jasper, Ala., on the south. They buy goods in large quantities, and, whenever possible, direct from the factory.

McGlenn Bros., Idaho Springs, Colo., have been succeeded by the C. P. Shields Hardware Company, who have been incorporated with a capital stock of $15,000, fully paid up. The company handle Shelf and Heavy Hardware, Stoves, Tinware, Mining Supplies, etc., and while the business mainly will be retail, some wholesaling will be done.

Burroughs B. Walling has purchased the business of J. York & Co., Summit, N. J., and will continue at the old stand. Mr. Walling was formerly treasurer of Miller, Sears & Walling Company, New York, and was also employed by Sickels & Nutting Company for a period of six years.

Alton Plumbing & Heating Company, Alton, Ill., have opened a Hardware store at Granite City, Ill., under the style of Bristow Hardware & Supply Company.

McRea & Son, who also have a store at St. Johnsville, N. Y., have exchanged their branch at Rome for the store at Fulton formerly conducted by Relyea & Rockwood.

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JOSEPH BRECK & SONS' CATALOGUE.

JOSEPH BRECK & SONS, Boston, Mass., issue the third edition of their catalogue, containing 350 pages, relating to Agricultural Hardware, Implements, Machines and Wooden Ware. The catalogue is copiously illustrated, with prices, showing an extensive variety of goods comprised in the above lines, covering new and improved Implements and Machinery desirable for use on the farm, garden and lawn, as well as a full line of Wooden Ware, Household Utensils and Poultry Supplies. For more than three-quarters of a century the firm have carried on an agricultural and seed business under the same roof, and those now in control are of the second and third generation.

WHITE & EISENMANN.

WHITE & EISENMANN is the name of a new firm, who, May 1, will establish a business in Hardware and House Furnishing Specialties at 124 Chambers street. J. Palmer White has been for 22 years with James S. Barron & Co., the large Wooden Ware and House Furnishing Goods concern, now at West Broadway and Franklin street, New York, beginning as office boy and gradually working his way up. For the last 12 years he has been buyer and sales manager. Mr. White has the reputation of being a shrewd buyer and good business man. Mr. Eisenmann has been eight years with the same house, and is an alert, hustling salesman. Until the new firm begin business they will remain with the old house, whose good will and sincere wishes for success will go with them in their new departure.

THE AMERICAN CAN COMPANY.

THE AMERICAN CAN COMPANY, with general offices at Chicago, New York, Baltimore and San Francisco, and local sales offices in all large cities of the United States, have just issued No. 11—1903 Catalogue. The company announce that they have recently enlarged their Toledo factory and are, therefore, in better condition to take care of orders intrusted to them. The catalogue is profusely illustrated, with data relating to Pieced and Stamped Tin and Galvanized Ware, classified under the following headings: Pieced Tinware, Plain Stamped Ware, Retinned Stamped Ware, Japanned Goods, Galvanized Goods, Copper Goods and Specialties.

W. B. BELKNAP & CO.

W. B. BELKNAP & CO., Louisville, Ky., have just secured for $18,000 a piece of property opposite their building on Main street. The property will be remodeled and fitted up, and will then be occupied by the company's printing office and Harness and Saddlery factory. The building fronts 58 feet on Main street, and has a depth of 210 feet. It will afford ample room for the purposes of the company. Another purchase made by the Belknaps is the piece of property belonging to the Ormsby Estate on Washington street, between Second and Third. This property fronts 52 feet on Washington street and has a depth of 336 feet. It will be utilized for stables and a warehouse.

MISCELLANEOUS NOTE.

Short Socket Firmer Beveled Chisels in Canvas Rolls.

C. E. Jennings & Co., 101 Reade street, New York, have put on the market a group of short socket firmer chisels with beveled edges in sets of six, ranging from ⅛ to 1¼ inches, and from ¼ to 1½ inches inclusive, with cocobolo handles. They are put up in both canvas rolls and boxes, while still others taking the same range of sizes are furnished with hickory handles in hinged boxes. The newest feature concerns the sets in rolls which are of brown canvas outside and lined with black canton flannel, with webbing through the center to hold the chisel shanks, the edge of the blades entering stitched compartments, which effectually protect the cutting edges. The roll can be hung flat above a workman's bench by driving wire nails through two upper corner eyelets provided for that purpose, a flap of the lining material protecting the blade surfaces, or rolled up and secured by means of a strap with patent buckle and carried in the workman's kit. The chisels are made from finest tool steel, the 1-inch blades being 3½ inches long from the shoulder. They are designed not only for amateurs, but for the use of expert mechanics when they wish to get down close to their work. Each chisel is ground sharp and fully warranted, the canvas roll sets weighing about 2¾ pounds.

The Cam Lever Wrench.

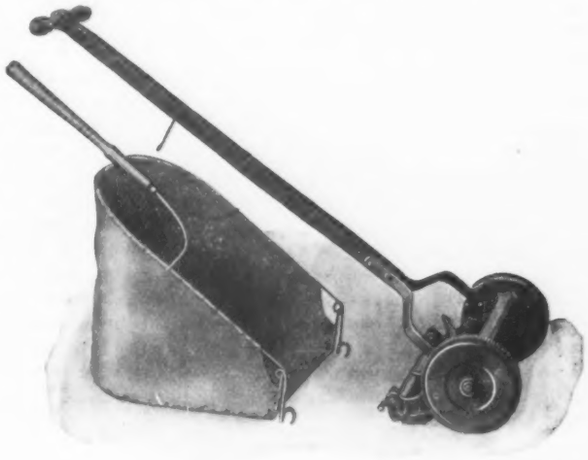
The Billings & Spencer Company of Hartford, Conn., are putting on the market the cam lever wrench shown herewith. This is referred to as combining the advantages of the ordinary screw wrench with a wrench which does not require an exact adjustment of the jaws to the part to be seized. The cam lever when closed forms a part of the handle, but when opened, which is accomplished by pressing down the catch at the end of the

The Cam Lever Wrench.

handle, the cam is brought into play. The sliding jaw is screwed up until it nearly seizes the nut and the pressure of the lever toward the handle causes a firm grip, the sliding jaw being forced against the nut. The cam is capable of taking up nearly if not quite ⅛ inch. One advantage claimed for the wrench is that it does not jam the corners of the nut.

The Easy Emptying Grass Catcher.

The Specialty Mfg. Company, St. Anthony Park, Minn., are offering the grass catcher herewith shown. The principal feature of the catcher is that it is so con-



The Easy Emptying Grass Catcher.

structed so as to be easily lifted from the mower. Another point is durability, the frame being made from round galvanized iron, the handle of hard wood and the covering of heavy duck. The device is readily adjustable to fit any sized lawn mower, can be raised or lowered, set forward or back, made wider or narrower, and when once fitted needs little if any attention. Being readily detached, it can be hung up to dry when not in use, thus increasing the life of the material from which it is made.

porated with a capital stock of $10,000; surplus, $3500. The company deal in Shelf and Heavy Hardware, Tinware, Stoves, Farming Implements, Harness, Buggies, Sporting Goods, &c.

Shallish & Rich in the Hardware business in Auburn, N. Y., have dissolved partnership. Hiram J. Rich has purchased the interest of Harry Shallish, and will continue the business under his own name at the old quarters.

Van Bockern & Harms have succeeded to the Hardware business formerly carried on by the Jim River Land Company in Lenox, S. D.

D. W. Forsyth, Cumberland, Ohio, who has carried on the Hardware business at that point for the past 37 years, has sold out to J. B. Beckett, who will continue at the old stand. Mr. Beckett will add materially to the stock, and will also carry a line of Paints, Oils, White Lead and Varnishes.

Margaret DeWolfe, St. Stephen, N. B., announces that she has purchased the interest of W. A. Dinsmore in the firm of DeWolfe & Dinsmore, and will continue the business under the management of her son, E. L. DeWolfe. The firm will be incorporated under the style of the DeWolfe Hardware Company as soon as letters patent can be issued.

H. M. Bailey, Sheffield, Ala., has just been succeeded by the Bailey-Donk Hardware Company, not incorporated. John Donk, who has been taken into partnership by Mr. Bailey, while a young man, has had about 10 years' experience in the Hardware business, having been for seven years with W. B. Belknap & Co. and for the last three years with the Simmons Hardware Company. Mr. Donk has severed his connection with the latter concern and will devote his entire attention to the business of the new firm. The working capital of the firm will be doubled, which will enable them to carry a much larger stock than has heretofore been the case. The lines carried will be the same as formerly handled by Mr. Bailey, only on a larger scale. They are the following: Shelf and Heavy Hardware, Stoves, Tinware, Glassware, Crockery, Sash and Doors, Window Glass, Lime, Cement, Plaster, Hair, Sewer Pipe, Oils, Varnishes, Brushes, Buggies, Wagons, Harness, Garden Tools, Farming Implements, Pipe Fittings, Grates, Mantels, Furnace and Plumbing Supplies, etc. Mr. Bailey's store was opened just a year ago, he having resigned as secretary of the Mayberry Hardware Company of Birmingham to go into business for himself. The jobbing business of the concern extends from Decatur on the east to Corinth, Miss., on the west, and from Mount Pleasant, Tenn., on the north to Jasper, Ala., on the south. They buy goods in large quantities, and, whenever possible, direct from the factory.

McGlenn Bros., Idaho Springs, Colo., have been succeeded by the C. P. Shields Hardware Company, who have been incorporated with a capital stock of $15,000, fully paid up. The company handle Shelf and Heavy Hardware, Stoves, Tinware, Mining Supplies, etc., and while the business mainly will be retail, some wholesaling will be done.

Burroughs B. Walling has purchased the business of J. York & Co., Summit, N. J., and will continue at the old stand. Mr. Walling was formerly treasurer of Miller, Sears & Walling Company, New York, and was also employed by Sickels & Nutting Company for a period of six years.

Alton Plumbing & Heating Company, Alton, Ill., have opened a Hardware store at Granite City, Ill., under the style of Bristow Hardware & Supply Company.

McRea & Son, who also have a store at St. Johnsville, N. Y., have exchanged their branch at Rome for the store at Fulton formerly conducted by Relyea & Rockwood.

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JOSEPH BRECK & SONS' CATALOGUE.

JOSEPH BRECK & SONS, Boston, Mass., issue the third edition of their catalogue, containing 350 pages, relating to Agricultural Hardware, Implements, Machines and Wooden Ware. The catalogue is copiously illustrated, with prices, showing an extensive variety of goods comprised in the above lines, covering new and improved Implements and Machinery desirable for use on the farm, garden and lawn, as well as a full line of Wooden Ware, Household Utensils and Poultry Supplies. For more than three-quarters of a century the firm have carried on an agricultural and seed business under the same roof, and those now in control are of the second and third generation.

WHITE & EISENMANN.

WHITE & EISENMANN is the name of a new firm, who, May 1, will establish a business in Hardware and House Furnishing Specialties at 124 Chambers street. J. Palmer White has been for 22 years with James S. Barron & Co., the large Wooden Ware and House Furnishing Goods concern, now at West Broadway and Franklin street, New York, beginning as office boy and gradually working his way up. For the last 12 years he has been buyer and sales manager. Mr. White has the reputation of being a shrewd buyer and good business man. Mr. Eisenmann has been eight years with the same house, and is an alert, hustling salesman. Until the new firm begin business they will remain with the old house, whose good will and sincere wishes for success will go with them in their new departure.

THE AMERICAN CAN COMPANY.

THE AMERICAN CAN COMPANY, with general offices at Chicago, New York, Baltimore and San Francisco, and local sales offices in all large cities of the United States, have just issued No. 11—1903 Catalogue. The company announce that they have recently enlarged their Toledo factory and are, therefore, in better condition to take care of orders intrusted to them. The catalogue is profusely illustrated, with data relating to Pieced and Stamped Tin and Galvanized Ware, classified under the following headings: Pieced Tinware, Plain Stamped Ware, Retinned Stamped Ware, Japanned Goods, Galvanized Goods, Copper Goods and Specialties.

W. B. BELKNAP & CO.

W. B. BELKNAP & CO., Louisville, Ky., have just secured for $18,000 a piece of property opposite their building on Main street. The property will be remodeled and fitted up, and will then be occupied by the company's printing office and Harness and Saddlery factory. The building fronts 58 feet on Main street, and has a depth of 210 feet. It will afford ample room for the purposes of the company. Another purchase made by the Belknaps is the piece of property belonging to the Ormsby Estate on Washington street, between Second and Third. This property fronts 52 feet on Washington street and has a depth of 336 feet. It will be utilized for stables and a warehouse.

MISCELLANEOUS NOTE.

Short Socket Firmer Beveled Chisels in Canvas Rolls.

C. E. Jennings & Co., 101 Reade street, New York, have put on the market a group of short socket firmer chisels with beveled edges in sets of six, ranging from ⅛ to 1¼ inches, and from ¼ to 1½ inches inclusive, with cocobolo handles. They are put up in both canvas rolls and boxes, while still others taking the same range of sizes are furnished with hickory handles in hinged boxes. The newest feature concerns the sets in rolls which are of brown canvas outside and lined with black canton flannel, with webbing through the center to hold the chisel shanks, the edge of the blades entering stitched compartments, which effectually protect the cutting edges. The roll can be hung flat above a workman's bench by driving wire nails through two upper corner eyelets provided for that purpose, a flap of the lining material protecting the blade surfaces, or rolled up and secured by means of a strap with patent buckle and carried in the workman's kit. The chisels are made from finest tool steel, the 1-inch blades being 3½ inches long from the shoulder. They are designed not only for amateurs, but for the use of expert mechanics when they wish to get down close to their work. Each chisel is ground sharp and fully warranted, the canvas roll sets weighing about 2¾ pounds.

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The Cam Lever Wrench.

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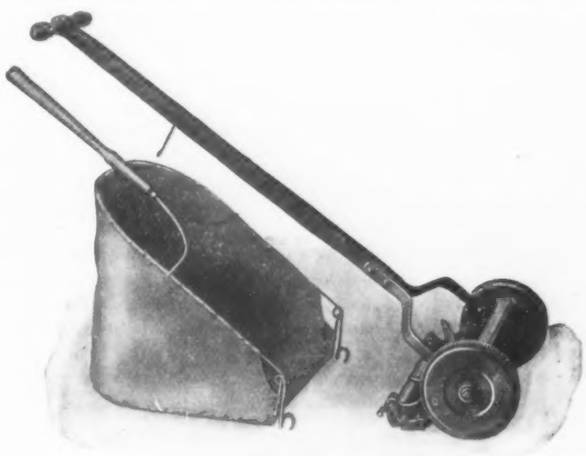


The Easy Emptying Grass Catcher.

The Diehl Electric Fans.

The accompanying illustrations represent two of the line of electric fans offered by the Diehl Mfg. Company, Elizabethport, N. J. The desk fan motor shown in Fig. 1 is referred to as appealing to users whose electricity is measured by meter, and the central station mapagers who furnish electricity at a fixed monthly rate. A special feature in the design is, it is explained, that the two field cores are cast integral with one frame, making an unbroken magnetic circuit. The same care in construction is given as in the company's larger motors and generators. The armature is built up of thin, soft iron with slots in the periphery, cut accurately, for the reception and protection of the double silk insulated wire. The commutator is made of hard drawn copper bars with mica insulation. The self aligning bronze bearings are self oiling, having an improved self oiling wick oil cup. The brush holders are alluded to as being unique in design, no wires are shown, and the carbon brushes are easily removed by unscrewing the fiber cap. The frame and supporting base have a smooth finish of enamel with suitable decoration. The blades, guards and trimmings are furnished in oxidized copper, nickel or brass, as desired.

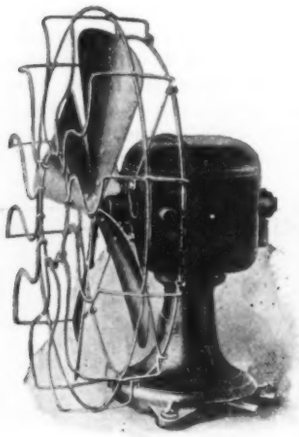


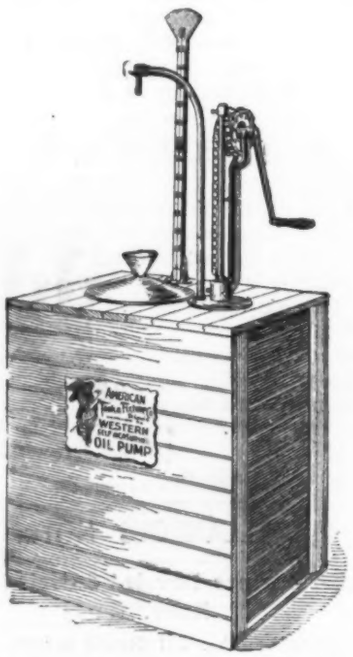
Fig. 1.—The Diehl Desk Fan Motor No. 30.

Fig. 2.—The Diehl Ceiling Fan No. 45.

The ceiling fan, Fig. 2, has an iron clad armature and a hard drawn copper commutator, mounted on a hollow steel shaft, case hardened. The self oiling bearings are described as only requiring to be replenished each season and as being so designed that it is impossible to drip or throw oil. The brush holders are of the same type as is used on the desk fan. The working parts are easily accessible and the armature may be removed without detaching the body from the ceiling. The fan is spoken of as being artistic in design and presenting a handsome and attractive appearance, as operating at high speed and being economical in current consumption. It is furnished with casing on pipe and four special nyssa wood blades. All parts of the fan are made to gauge and are interchangeable.

The Crescent Self Measuring and Self Registering Tank.

The Acorn Brass Mfg. Company, Chicago, Ill., are offering the tank shown herewith. It is made of No. 26 galvanized iron, double seamed, the corners heavily leaded to prevent both breakage and leakage. The tank is then inclosed in a jacket of ½-inch kiln dried Georgia pine. It is explained that the valves of the valve seat in the pump are arranged with special care, and so closely fitted that it is impossible for them to get out of order. The pump will measure from ½ pint to ½ gallon at a stroke, and has a rotary wheel action with an endless chain, to save friction and lost motion. The pump is supplied with the company's antidrip nozzle, which cuts the flow of oil as soon as the pressure is released from the pump, avoiding soiled hands. It is pointed out that the entire action of the pump is on an automatic scale. The indicator is a double sealed tin float, attached to a chain passing over a standard wheel and hung to a small lead weight. The graduating rod is marked in plain figures from 5 gallons to 65 gallons, or higher, according to the size of the tank. The shield indicator shows at a glance the amount of oil put in or taken out. The point is made that the tank being square and compact takes up less room than the ordinary round tank, and that it will save in leakage, dripping and waste its cost in less than nine months. The tank is designed for handling oils at retail.



The Crescent Self Measuring and Self Registering Tank.

A. L. Titus, Binghamton, N. Y., has recently moved into his handsome new store, which he has just completed at 372 Chenango street. The store is a three-story brick structure about 35 x 100. It is heated by steam, and is equipped with elevator, lavatory, hard wood interior, and is one of the finest Hardware stores in Binghamton.

Bardsley's Atlas and Simplex Floor Spring Hinges.

Joseph Bardsley, 147-151 Baxter street, New York, has just put on the market the Atlas and Simplex patented double acting mortise floor spring hinges, as here illustrated. Figs. 1 and 2 represent the Atlas hinge, which is of high grade for fine work. The hinge proper,

Fig. 1.—Adjustable Top Attachment for Atlas Hinge.

Fig. 2, is that portion which is mortised into the floor, containing the spring and adjusting mechanism. The spring is a flat spiral, strongest when the door is in a closed position, the tension decreasing as the door is opened. The tension of the spring can be easily increased or diminished to meet varying conditions, by merely removing the brass finish plate without disturbing the door. This operation exposes a 1-inch circular brass plate which covers a slotted screw, which, when

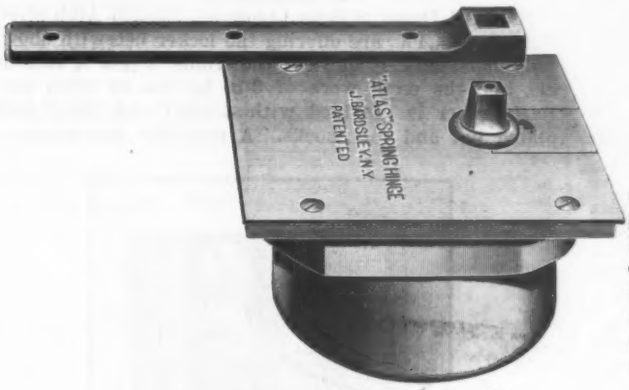


Fig. 2.—Atlas Double Acting Floor Spring Hinge.

turned to the right or left, increases or decreases the tension according as more or less power is required, the screw revolving two iron pins or dowels, which articulate with a ratchet in the casing, thereby tightening or loosening the coil spring. By another simple device in the casing the front of the door can be moved forward or backward a total of 3 inches to correct any error in mortising the hinge casing in position. In applying the hinge it is only necessary to mortise the lever that actuates the pintle and spring into the center of the bottom of the

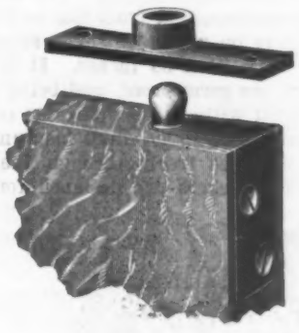


Fig. 3.—Improved Top Pivot for Simplex Hinge.

door, leaving both sides of the door itself undisturbed. If in setting the hinge the carpenter should find it necessary to align the door, it is only necessary to loosen two screws underneath the brass plate, placing the door in proper position and tightening the screws again, when the finish plate can be put in place. Fig. 1 shows the adjustable top attachment, which works on the walking beam principle, the upper half of which is mortised into the door casing and the lower part let into the top of door. When ready to complete the operation by swinging the door it is put in position at right angles with a normal position and with a few turns of the screw connected with the right hand end of the beam or lever the stout machined pinion is forced downward into its place in the closely fitted socket. The hinge is made in three sizes for inner or outer doors, 3, 3½ and 4 feet wide or less, and 2½, 2¾ and 3 feet wide or less, respectively. The floor plate is made regularly of polished brass, but can be furnished to order in any of the usual finishes for a slight additional cost. Figs. 3 and 4 show the Simplex mortise double acting floor spring hinge, which, as implied by the name, is of very simple construction and moderate cost, consisting of case, pintle, spring and lever. It can be used for inner doors, 1⅛ to 2 inches thick. It has an extra long spiral spring of round wire. Fig. 3 is

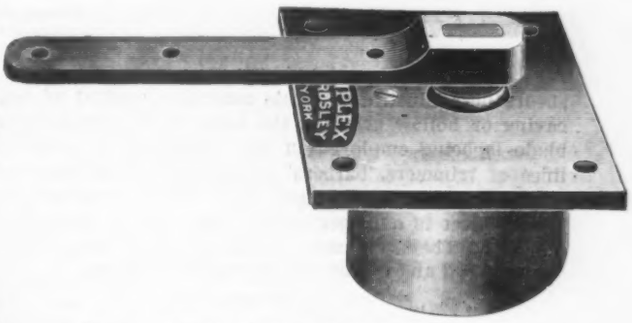
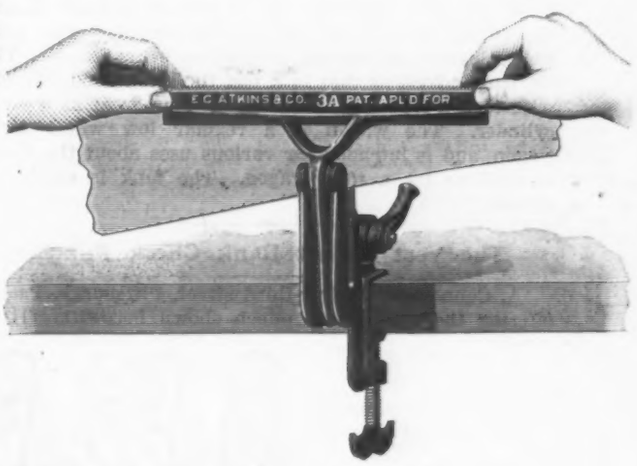


Fig. 4.—Simplex Double Acting Floor Spring Hinge.

an improved top pivot for this hinge. After the two parts are mortised into casing and door, the latter can be swung by removing the pin portion from corner of door, swinging the door to a right angle, slipping the pivot into the socket and into the door mortise and replacing the back screws. The hinge is made of iron in Boston finish or bronze plated, packed one in a box, or 25 in a case, complete with screws.

Atkins' Noiseless Saw Vise.

E. C. Atkins & Co., Indianapolis, Ind., are putting on the market the saw vise shown herewith. It operates on the lock lever principle, the jaws being made to open and close by simply pushing them forward and back. One of the most desirable features is the ease with which a saw can be adjusted with both hands, as shown in the



Atkins' Noiseless Saw Vise.

illustration, so that the teeth will be just right above the face of the jaws and the vise instantly tightened without removing the hands. The point is made that the vise is set so low down on the bench that there is no leverage to permit vibration and, therefore, that it is very rigid; that rubber cushions in the jaws prevent disagreeable noise; that it is made of the best material and finely finished, and that all wearing parts are reinforced.

Hollow Ground Shears and Scissors.

Krusius Bros., 296 Broadway, are manufacturing at their works in Solingen, Germany, the hollow ground shears here illustrated. This razor-like method of concaving or hollow grinding the inner side of each shear blade is being employed in the production of complete lines of trimmers, barbers' shears, ladies' scissors and pocket scissors in the various sizes. What is claimed for this product is a longer cutting edge and a very much finer set. They are made of English steel, full polished and nickeled and can be sold at moderate prices.

Hollow Ground Scissors.

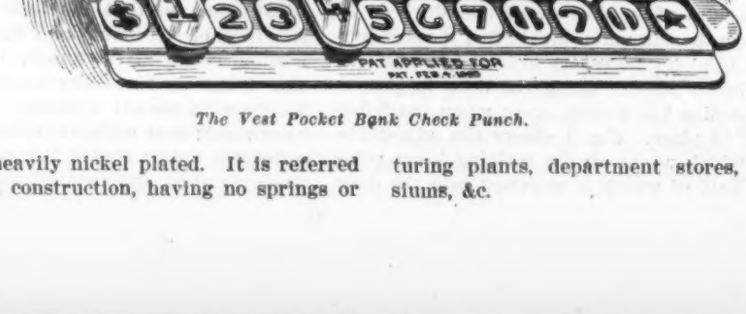
The New Round Corrugated Galvanized Wagon Tank.

The O. K. Harry Steel Works, 2333 to 2335 Papin street, St. Louis, Mo., are offering the wagon tank shown herewith. The tank is made of galvanized steel 16 and 20 gauges, well riveted with double row of rivets; also well soldered and banded with extra heavy bands. The company advise us that in a test the corrugated cylinder withstood a load more than 29 times as great as a plain cylinder. The wagon is a regular low wheel farm wagon, and is intended for various uses about the farm, as well as for a tank wagon. The tank is easily removed.

The New Round Corrugated Galvanized Wagon Tank.

The Vest Pocket Bank Check Punch.

A. Connor, 409 Thirty-third street, Pittsburgh, Pa., is offering the bank check punch shown herewith. It is made of hard steel, heavily nickel plated. It is referred to as being simple in construction, having no springs or wheels in its construction, and as making a clean cut of numbers, preventing the insertion or creasing out of numbers which, it is remarked, can be done on pin hole perforated numbers. The punch is inclosed in a neat leather case, and has been indorsed, it is stated, by the American Bankers' Association.



The Vest Pocket Bank Check Punch.

The Pen Dar Metal Locker.

Edward Darby & Sons Company, 233-235 Arch street, Philadelphia, Pa., are offering the locker herewith shown. It is made entirely of steel, the frame is ¾ x ¾ inch angle, and the mesh work of 3-16 by No. 18 strap steel. Each locker is provided with a shelf and three brass plated hat and coat hooks. A separate, nonchangeable lock and key accompanies each locker, and a master key for all the lockers, if desired. The lockers can be made of any dimensions, and from one to 100 or more in sections, as may be required. The standard size of each locker is 12 x 12 x 60 inches. It is pointed out that the lockers are germ proof, and being of open mesh can be disinfected without removing the contents; that they are fire proof and thus reduce insurance rates, and that the air circulates freely through the sides, front and bottom. The lockers are designed for use in manufacturing plants, department stores, club houses, gymnasiums, &c.

The Pen Dar Metal Locker.

Current Hardware Prices.

REVISED APRIL 21, 1903.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued April, 1902, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $120@140
See also *Emery.*

Adjusters, Blind—

Domestic, ₱ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent 25&5%
Tapiin's Perfection 25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Arman l Hammer, Wrought ₱ lb 8½@8¾c
Buel Ma. Co. Trenton ₱ lb 9½@9¾c
Eagle Anvils ₱ lb 7¼@7¾c
Hay-Budden, Wrought 9@9¼c
Horseshoe brand, Wrought 9@9¼c

Imported—

Peter Wright & Sons ₱ lb 10½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00 50&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots 20%
Lots of 3 doz. 30%

Augers and Bits—

Com. Double Spur .70@70&10
Boring Machine Augers ....66⅔@70%
Car Bits, 12-in. twist .60@60&10%
Jennings' Pattern
Auger Bits .50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25&10%
No. 30, R. Jennings' List. .40&7½&10%
Russell Jennings 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls .50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

Standard List .65&5@70%

Expansive Bits—

Clark's small, $15; large, $26 .50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18 .50&10%
C. E. Jennings & Co., Steer's Pat. .25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut ..gro. $2.50@3.00
German Pattern .....gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal .25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhandled, Shouldered .gro. 65@66c
Unhandled, Patent .....gro. 66@70c
Peg Awls:
Unhandled, Patent ....gro. 31@34c
Unhandled, Shouldered .gro. 65@70c
Scratch Awls:
Handled, Common ..gro. $2.50@4.00
Handled, Socket ..gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands ...$6.00
First Quality, jobbers' brands ..$5.50
Second Quality .....$5.00@5.25

Axle Grease—See *Grease, Axle.*

Axles— *Iron or Steel*

Concord, Loose Collar .... 4½@5c
Concord, Solid Collar ....4¾@5½c
No. 1 Common .....3¾@4 c
No. 1 Com. New Style ..3¾@4 c
No. 2, Solid Collar .....4¼@4½c
Nos. 11 to 14 ... ...60&10&10&10%
Nos. 15 to 18 .... ⅝
Nos. 19 to 22 .....70&10&5%
} 2% cash 10 days.

Boxes, Axle—

Common and Concord, not turned .. lb. 4¼@4½c
Common and Concord, turned ..... lb. 5@5¼c
Half Patent .....lb. 9@9½c

Balances— Sash—

Caldwell new list 50%
Pullman's 60%

Spring—

Spring Balances .....50&10@60%
Chatillon's:
Light Sug. Balances. .....40&10%
Straight Balances, ... 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb. .. 3@3¼c

Towel—

No. 10 Ideal, Nickel Plate .....₱ gro, $8.50
No. 20 Ideal, Brass Finish .....₱ gro $8.50

Baskets—

Hoffman's Brick Baskets. .....each $3.25

Beams, Scale—

Scale Beams, List Jan. 12, '02 .40&10%
Chattillon's No. 1 30%
Chattillon's No. 2 40%

Beaters— Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro.....
$12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size.....14.00
Taplin Mfg. Co.: ₱ gro.
No. 00 Improved Dover.....$6.50
No. 75 Improved Dover.....7.50
No. 75-2 Imp'd Dover, Tin'd.....8.00
No. 100 Improved Dover.....8.00
No. 102 Improved Dover, Tin'd. .8 50
No. 150 Improved Dover, Hotel .$15 00
No. 152 Imp'd Dover, Hotel, T'd .$17.00
No 200 Imp'd Dover Tumbler.....$9.00
No. 202 Imp'd Dover Tumbler, Tin'd $10.00
No. 300, Imp'd Dover Mammoth, ₱ doz.....$27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

Bellows—

Blacksmith, Standard List .70@70&10%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:
Each .$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*15.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$4.75*	*5.25*	*5.75*	*6.25*	*7.00*	*8.00*

Net Prices.

Bells— Cow—

Ordinary goods .....75&5@75&10%
High grade .....70@70&10%
Jersey .....75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
nome, R. & E. Mfg. Co.'s .....55&10%
Lever and Pull, Sargent's ....60&10&10%
Yankee Gong 50%

Hand—

Hand Bells, Polished ....60&5@60&10%
White Metal .....55@55&10%
Nickel Plated .....50@5 0&5%
Swiss .....60@60&10%
Coue's Globe Hand Bells ...33⅓@33⅓&10%
Silver Chime .....33⅓@33⅓&10%

Miscellaneous—

Farm Bells ..... lb. 2@3½c
Steel Alloy Church and School 60%
American Tube & Stamp'g Co. Gongs .70%
Trip Gong Bells .....55&10@60%

Belting— Rubber—

Agricultural (Low Grade) .75&10@80%
Common Standard .....75@75&10%
Standard .....70@70&10%
Extra .....60&10&5%
High Grade ..... 50&10@50&10&5%
Boston Belting Co.:
Seamless Stitched Imperial ..... 45&5%
Boston .....50&5%
Niagara .....60&5%

Leather—

Extra Heavy, Short Lap ....60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard .....70@70&5%
Light Standard .....70&10%
Cut Leather Lacing .....60&10%
Leather Lacing Sides, per sq. ft ..18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $8.75; No. 2, $6.50; No. 3, $9.50; No. 4, $14.75; No. 5, $18.75.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden .....70&10@75%
Hollow Steel Blocks, with Ford's Patent Sheaves .....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron .....50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c. ..... 30&10%

Bolts—

Carriage, Machine &c.—

Common, list Feb. 1, '02 ...60&10@..%
Norway Iron, $3.00, list Jan. 1, '98 30@30&5%
Phila. Eagle, $3.00 list May 24, '99 .... 30@30&5%
Bolt Ends, list Feb. 14, '95 ...65&5@..%
Machine, list Oct. 1, '99 ..... 65@..%
Machine with C & T. Nuts ..... 60&2½@..%

NOTE.—*Jobbers are in many cases underselling the manufacturers.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel ..75&10@75&10&10%
Wrought " Bronzed .50&5@50&10%
Wrought Flush, B. K. .50&10@50&10%
Wrought Shutter ...40&10&10@60&5%
Wrought Square Neck .....50@50&10%
Wrought Sunk .....50@50&10%
Ives' Patent Door 60%

Stove and Plow—

Plow ..... 60@..%
Stove .....30@30&10%

Tire—

Common .....72½@72½&10%
Norway Iron .....50@50&5%
American Screw Company:
Norway Phila., list Oct. 16, '84 .....80%
Eagle Phila., list Oct. 16, '84 .....82½%
Bay State, list Dec. 28, '99 .....72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ....80%
Eagle Phila., list Oct. 16, '84 .....82½%
Eclipse, list Dec. 28, '99 .....72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 .....72½%
Norway Phila., list Oct. '84 .....80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	*1¼*	*1½*	*1¾*	*2*
Per doz	*$4.30*	*5.00*	*5.75*	*7.25*
Inch	.....	*2¼*		*2½*
Per Doz	.....	*$8.65*		*11.50*

Enterprise Mfg. Co., No. 1, $1.35; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. .....25&10%
Langdon .....15&10%
Schatz 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American ..$1.15@1.25
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford s. 60%
Fray's No. 70 to 120, $1 to 133, 207 to 414 ..... 60%
C. E. Jennings & Co. .....50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent ..50%
Millers Falls Drill Braces .....25&10%
P., S. & W. Co. Peck's Patent 60&10&6⅔%

Brackets—

Wrought Steel .....75&10@80%
Bradley's Wire Shelf:
Full cases .....80&10&10%
Broken cases .....80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets .....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co. .....75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier ..... ₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list, Sept., '96 ....30@30&5%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad .....50@50&10%
Fast Joint, Narrow .....50@50&10%
Loose Joint .....70&5@70&10%
Loose Pin .....70&5@70&10%
Mayer's Hinges .....70&5@70&10%
Parliament Butts .....70&5@70&10%

Wrought Steel—

Table and Back Flaps 60%
Narrow and Broad 60%
Inside Blind .....66&10%
Loose Pin .....60&10%
Loose Pin, Bali and Steeple Tip 75%
Japanned, Ball Tip Butts ...67½%
Bronzed Wrt, Nar, and Inside Blind Butts .....45&20@45&25%

Extra 25% 10 & 2½%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series .....40&10%
Hendryx Bronze:
700, 800 series .....40&10%
Hendryx Enameled .....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong .....per lb. 4@4½c
Sharp, 1 prong .....per lb. 4½@4¾c
Perkins' Blunt Toe ..... ₱ lb 3½c
Perkins' Sharp Toe ..... ₱ lb 4 c

Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons .....per doz $2.00

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro

Caps—Percussion—

Eley's E. B. 60c
G. D. .....*per M* $2@$3c
F. L. .....*per M* $2@..c
G. E. .....*per M* $7@50c
Musket .....*per M* $2@..c

Primers—

Berdan Primers, $1.00 per M 5%
B. L. Caps (Sturtevant Shells) $1.00 per M 5%
All other primers per M. $1.25@$1.27

Cartridges—

Blank Cartridges:
32 C. F., $5.50 .....10&5%
38 C. F., $7 00 .....10&5%
22 cal. Rim, $1 50 .....10&5%
32 cal. Rim, $2.75 .....10&5%
B. B. Caps, Con. Ball Swgd $1 00
B. B. Caps, Round Ball $1.50
Central Fire 25%
Target and Sporting Rifle .....15&5%
Primed Shells and Bullets .....15&10%
Rim Fire Sporting 50%
Rim Fire, Military .....15&5%

Casters—

Bed .....70@70&10%
Plate .....60@60&5%
Philadelphia .....75@75&10%
Boss .....70&10%
Boss Anti-Friction .....70&10%
Martin's Patent (Phœnix) 45%
Standard Ball Bearing 45%
Tucker's Patent low list 80%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3/16	1/4	5-16	3/8	7-16	1/2	9-16
3.50	6.00	4.90	4.00	3.80	3.70	3.65
5/8	3/4	7/8	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil .....60&10@10%

Halters and Ties—

Halter Chains .....60@10@60@10@10%
German Halter Chains, list July 24, '97 .....60@10&10@70@10%
Cow Ties .....50@1/@60%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring ...$27.00
6½—6-2, Straight, with ring ..$23.00
6½—8-3, Straight, with ring .. $33.00
6½—10-3, Straight, with ring ..$37.00
Add 25c per pair for Hooks.
Twist Traces 25c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains ..60@60@10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron .....60@10@60@10@10%
Brass .....60@10@60@10@10%
Safety Chain .....70@10@75@5%
Gal. Pump Chain .....*lb.* 4@4½c
Covert Mfg. Co.
Breast .....40&2%
Halter .....40&2%
Heel .....40&2%
Rein .....40&2%
Stallion .....40&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. C. ll and Halters .....40@45&5%
Am. Cow Ties .....45@50%
Eureka Coll and Halter .....45@50&5%
Niagara Coll and Halters .....45@50&5%
Niagara Cow Ties .....45&5@50&10&5%
Wire Dog Chains .....45@50&5%
Wire Goods Co.:
Dog Chain .....70&10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)

Carpenters' Blue .....*gro.* 40@45c
Carpenters', Red .....*gro.* 35@40c
Carpenters', White .....*gro.* 30@35c
See also Crayons.

Checks, Door—

Bardsley's .....40&10%
Columbia .....50&10%
Eclipse 60%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 35%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jenning. & Co.'s Machinists' Tool Ch sts .....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List .....70@70&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 .....60&10%
C. E. Jennings & Co. Socket Framing No. 15 .....60&10%
Swan's 70%
L. & I. J. White .....30@30&5%

Tanged—

Tanged Firmers .....40@5@40&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 191, 181 .....16⅔&10%
L. & I. J. White, Tanged .....25&5%

Cold—

Cold Chisels, good quality. lb. 13@15c
Cold Chisels, fair quality .. lb. 11@12c
Cold Chisels, ordinary .....*lb.* 8@9c

Chucks—

Beach Pat., each $8.00.. .....35&5%
Pratt's Positive Drive 25%
Empire 25%
Blacksmiths' 25%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard .30%
Drill Chucks, New Model 2%
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 40%
Cyl. Drill 30%
Geared Scroll 30%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%
Wescott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 40%
Little Giant Double Grip Drill 40%
Little Giant Drill, Improved 40%
Oneida Drill 40%
Scroll Combination Lathe 40%

Clamps—

Adjustable, Hammers' .....20@20&5%
Cabinet, Sargent's .....50&10%
Carriage Makers', P., S. & W. Co. 50%
Carriage Makers' Sargent's 60%
Besly, Parallel .....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co. 40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable 55%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel ...₩ doz. $4.05 net
Star Shank, All Steel ...₩ doz. $3.24 net
W. & C. Shank, All steel, 7¼ in. ₩ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
New Haven Edge Tool Co.'s 45%
Fayette R. Plumb .....33⅓@33⅓&10%
P., S & W .....50@50&5%
L. & I. J. White 30%

Clippers—

Chicago Flexible Shaft Company
'93 Chicago Horse $8.75
1902 Chicago Horse $10.75
Lightning Belt $15.00
Chicago Belt $20.00
Stewart's Patent Sheep $18.50
} 25%

Clips Axle—

Eagle and Superior ¼ and 5-16 inch 70c10%
Norway, ¼ and 5-16 inch ..70@70c10%

Cloth and Netting, Wire

—*See Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs .....65c5@65c10%
Globe, Kerosene, Racking, &c., Cocks .....65c10@70%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—

Brass, Walter B. Stevens & Son's list. 40%
Embossed, Gilt, Walter B. Stevens & Son's list .....30&10%
Leather, Walter B. Stevens & Son's list 40%

Combs Mane and Tail—

Covert's Saddlery Works .....60&10%

Compasses Dividers, &c.

Ordinary Goods .....75@75&5%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%
J. Stevens A. & T. Co. .....25&10%

Compressors Corn Shock—

J. B. Hughes' ₩ doz. $2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
Eastern	75c7½%	75c2½%
Central	75c2½%	70c1½%
Southern	70c7½%	70c2 ½%
S. Western	65c2½&10%	65c10c5%

Terms, 2% for cash. With delivery on fast cruise.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	½	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70	
Gal.	3	4	6	8		
Iceland, ea.	$1.80	$2.10	$2.40	$3.00		
Gal.	2	3	4	6	8	
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90	25%

Galv. Lined side handles

Gal.	2	3	4	6	8	
Each.	$1.95	$2.15	$2.45	$3.35	$4.15	25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord— Sash—

Braided, Drab .....*lb.* 25c
Braided, White, Com .... *lb.* 17½@18c
Cable Laid Italian .. lb. A, 15c; *B,* 16c
Common India .....*lb* 9 @9½c
Cotton Sash Cord, Twisted ....12@16c
Patent Russia .....*lb* 1¼@13c
Cable Laid Russia .....*lb.* 13½@14c
India Hemp, Braided .....*lb* 1¼@15c
India Hemp, Twisted .....*lb.* 10@12c
Patent India, Twisted .....*lb.* 10@12c
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12 .....₩ lb 24 ¢
Anniston, Nos. 7 to 12 .....₩ lb 19 ¢
Old Colony, Nos. 7 to 12 .....₩ lb 18½¢
Anniston Drab, Nos. to 12 .....₩ lb 24 ¢
Pearl Braided, cotton .....₩ lb 17½¢
Massachusetts, White .....₩ lb 22½¢
Massachusetts, Drab .....₩ lb 26½¢
Eddystone Braided Cotton .....₩ lb 19¢
Harmony Cable Laid Italian .....₩ lb 18¢
Ossawan Mills:
Crown, Solid Braided White ...₩ lb 22¢
Braided, Giant, White .....₩ lb 20¢
Peerless:
Cable Laid Italian .....16¢
Cable Laid Russian .....14¢
Cable Laid India .....12¢
Braided India .....18¢
Phœnix, White .....19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton .....₩ lb 32½¢
Braided, Italian Hemp .....₩ lb 32½¢
Braided, Linen .....₩ lb 49¢
Braided, White Cotton, Spot. ₩ lb 28½¢
Nos. 6 cents, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ 15%
A quality, White, 35¢ 15%
B quality, Drab, 35¢ 15%
B quality, White, 30¢ 15%
Italian Hemp, 40¢ 15%
Linen, 57½¢ 15%

Wire, Picture—

List Oct., '00 .....85c10@85c10c5%

Crackers, Nut—

Little Giant .....₩ gr. $24.00

Cradles—

Grain 50%

Crayons—

White Round Crayons, gross 5½@6c Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square .....gr. $1.50
Rolling Mill Crayons .....gr. $2.50
Railroad Crayons (composition) gr. $2.00
} Case lots 20%
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy .....₩ doz. $7.00
Fort Madison, Light .....₩ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847 .....₩ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....₩ doz $3.00
Wm. Rogers & Son .....₩ doz. $2 50
Simeon L. & Geo. H. Rogers Company: 12 dwt. Medium Knives .....₩ doz. $3.00
No. 77 Medium Knives .....₩ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co. 40%
Reliable 50%
Smith & Hemenway Co. 70%
Woodward 40%

Meat and Food—

Hale's.. Nos.	*11 & 111*	*12 & 112*	*13 & 113*
Per doz	*$8.00*	*10.75*	*14.50*

American 30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$05	$50

Enterprise .....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2..5	$4.50	$6

Dixon's, ₩ doz .....30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₩ doz. $22.75 .....50&10%
Little Giant, ₩ doz .....33⅓&5@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$73.00	$68.00

N. E. Food Choppers 40%
Sterling .....10@10&1%
No 1 .....$2.00 each No. 2 $2.50 each
New Triumph No. 605, ₩ doz. $24.00 .....30&10@40%
Woodruff's, ₩ doz .....30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers .....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutter 24 x 7, 36 x 8, 30 x 9, 55%
Kraut Cutters 36 x 12, 40 x 12 .....60%
Sterling, $6.00 each 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ₩ gr. ...$18@$20
Slaw Cutters, 2 Knife, ₩ gr. ...$22@$30

Tobacco—

All Iron, Cheap .....*doz. $4.25@$4.50*
Enterprise .....25&10%
National, ₩ doz. Nos. 1, $21; No. 2, $18..40%
Sargent's, ₩ doz., No. 2 .....60%
Sargent's No 1 and 2 .....60&10%

Washer—

Appleton's, ₩ doz. $16.00 .....50&10%
Bonney's 40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger. 40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₩ doz $6.75
Iwan's Perfection Post Hole Digger, ₩ doz. $4.50
Iwan's Split Handle Post Hole Diggers, ₩ doz $7.50
Kohler's Universal .....₩ doz. $15.00
Kohler's Little Giant .....₩ doz. $12.60
Kohler's Hercules .....₩ doz. $10.00
Kohler's Invincible .....₩ doz. $9 00
Kohler's Rival .....₩ doz. $8 50
Kohler's Pioneer .....₩ doz. $7.50
Never-Break Post Hole Diggers, ₩ doz. $24.00 .....60%
Samson, ₩ doz. $34.00 .....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ¾ in. .....₩ doz, $10.50
Phillips', style 077, ¾ in. .....₩ doz, $8.00
Phillins', style x-v, ¾ in .....₩ doz, $11.00
Porter's Plain, No. 6 .....₩ doz. $8 75
Porter's Ornamental, No. 70. ₩ doz. $11.50
Porter's No. 99 .....$9.00
Porter's No. 44 .....$10.75

Drawers Money—

Tucker's Pat. Alarm Till No. 1, ₩ doz. $18; No. 2, $15; No. 3, $12; No. 4, $10.

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill .. each $1.50@$1.75
Blacksmiths' Self-feeding. $3.75@$4.00
Breast, Millers Falls .....15 c
Breast, P., S. & W 40%
Goodell Automatic Drills..40&5@40&10%
Jones & Lamson Automatic Drills Nos. 2 and 3 .....10%&10%
Johnson's Drill Points .....16⅔&5@10%
Millers Falls Automatic Drills ...33⅓&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 33⅓%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 .....33⅓%

Twist Drills—

Standard List .... 60c10@60c10c10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Baisey's Screw Holder and Driver, ₩ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9 .40%
Buck Bros. 30%
Buck Bros' Screw Driver Bits 30%
Champion 50%
Edson 60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet 35%
Goodell's Auto 50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle 50%
Mayhew's Monarch .....40&10%
Millers Falls, Nos. 2) and 21 .....25&10%
Millers Falls, Nos. 11, 12, 41, 42 .....15&10%
Never Turn 60%
New England Specialty Co. 50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 .....60%
Nos. 20 and 40 .....70%
Smith & Hemenway Co .....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 70@60&10&10%
No. 86 .....70@70&10&10%
Swan's:
Nos. 65 to 68 .....50%
No. 40 .....40&10%
Nos. 25, 35 and 45 .....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*
Eastern	80c7½%
Central	8 c2½%
Southern	75c10c5%
S. Western	75c10c2½%

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments 60%
Perfect Elbows (S. S. & Co.) 30%

Emery, Turkish—

	4to½6	5&10	150 Flour
Kegs .....*lb.*	5c	5½c	5 c
½ Kegs ..... *lb.*	5¼c	5¾c	5 ¾c
Kegs .....*lb*	5c	6c	
10-lb cans. 10 in case 6½		7c	6c
10-lb. cans less than 10	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's .....50&10%
Wallin's 30%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined .....50@50&10%
Metallic Key, Leather Lined 70@70&10%
Red Cedar .....40c10@50%
Petrolæum .....70c5@70c10%
B. & L. B. Co.:
Metal Key .....60&10%
Star 60%
West Lock .....50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined 50%
Joh. Sommers No Brand, Cedar 50%
John Sommer's Perfection Cedar 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved ¼ and ⅜ inch 35%
Self Measuring:
Enterprise, ₩ doz. $36.00 .....40&10%
Lane's, ₩ doz. $36.00 .....40&10%
National Measuring, ₩ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.

Best Brands	70c5@70c10%
Standard Brands	75@75c10c5%
Second Quality	75c10c10@80c5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 .....30%

Fixtures, Grindstone—

Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.60*	*2.75*	*3.00*	*3 50*	*4.40*

P., S. & W. Co. .....30&10@40%
Reading Hardware Co. 60%
Sargent's .....60&10&10%
Stowell's Giant Grindstone Hanger, ₩ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures Light.. 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—*Aug. 1, 1899, list.*

Hay, 2 tine 60%
Hay, 3 tine ..... 60&10%
Hay, 4 tine 66⅔%
Hay, Header and Baler 3 tine ..... 60&15%
Hay, Header and Baler, 4 tine 66⅔%
Grain or Barley 70%
Manure, 4 tine ..... 60&20%
Manure, 5 and 6 tine ..... 60&20%
Spading ..... 70&5%

Extra 10%

Iowa Dig-Eazy Potato 65%
Victor, Hay 66⅔%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 66⅔%
Champion, Manure ..... 60&20%
Columbia, Hay ..... 60%&5%
Columbia, Manure 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 60%&10&2½%
Dakota Reader ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Reader 66⅔%
W. & C. Favorite Wood Parley 4 tine, ₱ doz., $5.00; 6 tine, $6.00.
Plated.—See *Spoons.*

Frames— Saw—

Red, Polished and Varnished..doz. $1.15 @ $1.35
White ..... doz. 75@90c

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best	$1.45	1.65	1.95	2.40	3.20	4.20
Good	$1.25	1.40	1.70	2.15	2.75	3.75
Fair	$1.00	1.10	1.30	1.75	2.30	2.99

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp Fuse $2.60
Cotton Fuse 2.90
Single Taped Fuse 3.25
Double Taped Fuse 4.30
Triple Taped Fuse 5.00

10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&10%

Gauges—

Marking, Mortise, &c. ..... 50&10@50&10&10%
Fulton's Butt Gauge ..... 3%&10%
Stanley R. & L. Co.'s Butt & Bannet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire P. S. & W. Co ..... 30&10%

Cimlets— Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.60
Spike, Metal, Assorted gro. $2.80@3.25
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $3.25@3.50

Glass, American Window

Jobbers' List, Dec. 16, 1902.
From store. Single and Double 90&10%
F. O. B. factory, carload lots:
Single and Double ..... 80&20&2½%
2000 box lots ..... 90&25%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts) 33⅓@45%
List C, Cans (½ gal., gal.) ... 25@45%
International Glue Co. (Martin's) ..... 40&10&5%

Grease, Axle—

Common Grade ..... *gro. $5.00@6.00*
Dixon's Everlasting ... 10-₱ pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. ..... $2.00 } 33⅓%
Pike Mower Knife and Tool Grinder, each ..... $6.00 }
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000 ..... $9.00
Copper ₱ 1000 ..... $18.00

Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 60&5&2%
Sisal Rope ..... 20&2%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties .. 70%
Sisal Rope Ties ..... 60&10%

Hammers—

Handled Hammers—

Beller's Machinists' ..40&10@40&10&10%
Beller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40@40&10&10%
Peck, Stow & Wilcox 50%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 33⅓&7½@33⅓&1 &7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—

3 lb. and under ... lb. 45c } 75&5@75
3 to 5 lb. ... lb. 36c } &10%
Over 5 lb. ... lb. 30c }
Wilkinson's Smiths' ..... 9½c@10c lb.

Handles—

Agricultural Tool Handles—

Axe, Pick, &c. ..... *4 @ 5&5%*
Hoe, Rake, &c. ..... *60@60&5%*
Fork, Shovel, Spade, &c.:
Long Handles *60%*
D Handles *50%*

Cross-Cut Saw Handles—

Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... *gro. $2.30@$2.50*
Brad Awl ..... *gro. $1.75@$1.50*
Chisel Handles:
Apple Tanged Firmer, gro. ass'd, $2.35@$2.55; large, $2.50@$2.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; large, $2.50@$2.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25
Hickory Socket Firmer, gro. ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted ..... *gro. $1.60@$1.15*
Hammer, Hatchet, Axe, &c. *50%*
Hand Saw, Varnished, doz. 70@75c
Not Varnished ..... *55@60c*
Plane Handles:
Jack, doz. 25c; Jack Bolted..55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle, ₱ gro. ..... $0.35@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.85	1.20	1.50	1.90	2.30

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	$1.10	1.60	2.15	2.70

Alith Mfg. Co.
Reliable ..... per doz. $15.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 40%
Railroad 55%
Cronk & Carrier Mfg. Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing $4.15
Parlor, Standard $3.35
Parlor, New Model $2.85
Parlor New Champion $2.25
Barn Door, Standard. 50&10&10&5%
Covered ..... 50&10&10%
Special ..... 50&10&10&5%
Lawrence Bros.:
Advance 60%
Cleveland ..... 60&10%
Crown 60%
Giant ..... 50&10%
New York 60%
Peerless ..... 60&10%
Sterling 60%
Swing, No. 95 ..... 50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers .5&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door ..... 50&10%
Monarch Barn Door ..... 60&10%
Never Jump Hinge ..... 50&10%
Peerless ..... 60&10%
Perfection ..... 70&5%
Phœnix ..... 70&5%
Wagner's Adjustable ..... 70&10%
Warehouse Anti-Friction 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 ..... $2.25
Imp'd Wood Track No. 5 ..... $2.25
Imp'd Steel Track No. 7 ..... $2.70
Imp'd Steel Track No. 7 ..... $2.65
Ball B'r'g steel Track No. 9 ..... $2.50
Ball B'r'g Steel Track No. 10 ..... $2.50
Roller B'r'g Steel Track No. 11 ..... $2.40
Roller B'r'g Steel Track No. 12 ..... $2.40
Ball B'r'g Steel Track No 13 .. $2.75
Roller B'r'g steel Track No. 14 $2.65
Ball B'r'g Trolley Track No. 15 ..40%
Ball Brg Trolley Track No. 19 ..60&5%
Ball Bearing Tandem Trolley Track No. 16 ..... 40%
Silent Adjustable Track No. 18 ..40%
Auto Adjustable Track No. 22 .. 40%
Trolley B. D. No. 17 ..... $1.60
Trolley F. D. No. 120 ..... $2.70
Trolley F. D. No. 121 ..... $2.85
Trolley F. D. No. 151 ..... $3.00
Roller Bearing D. D. No. 25 .... 70&5
Roller Bearing U. S. B. D. ..... 70&5%
Anti Friction B. D. ..... 60&10%
Ives' Imp'd Wood Track No. 1 ..... $2.15
Ives' Imp'd Wood Track No. 2 ..$2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing 40%
Atlas 60%
Badger Barn Door 50%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Interstate 50%
Lundy Parlor Door 50
Magic 50%
Matchless 60%
Nansen ..... 60&10%
Railroad 50%
Street Car Door 50%
Steel, Nos. 300, 404, 500 ..... 40&15%
Stowell Parlor Door 50%
Wild West, Nos. 300, 404, 500 ..... 50%
Zenith for Wood Track 50%
A. L. Swett Iron Works:
Eagle ..... 60&10%
Hylo ..... 50&10%
Perfection 60%
Pilot 50%
Taylor & Boggis Fy Cos. 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing ... 40%
Velvet 50%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elv. Door, Nos 112 and 122½ 50%
Wilcox Elv. Door, No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge Ball Bearing 40%
For Track, see *Rail.*

Extra 5&10% often given.

Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz., net, $4.50

Hasps—

McKinney's Perfect Hasp ₱ doz. 50%

Hatchets—

Best Brands ..... *50@50&10%*
Cheaper Brands ..... *60@60&10%*
Note.—Net prices often made.

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.	*1*	*1½*	*2*
Doz. pair	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10&70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15. ..... 70&10%
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 7 &5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75%
1868, Old Pat'n, Nos. 1, 3 & 5. ..... 75%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75 .75%
Steamboat Gravity Locking, No. 10 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with Latches	$2.00	2.70	5.00
Hinges only	$1.40	2.05	3.80
Latches only	.70	.70	.85

New England:
With Latch ..... doz .... @ $2.50
Without Latch .... doz. .... @ $1.90
Reversible Self-Closing:
With Latch ..... doz. .... @ $1.80
Without Latch ..... doz. .... @ $1.45
Western:
With Latch ..... doz. $1.80
Without Latch ..... doz. $1.20
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—

Holdback, Cast Iron, gro $7.50@10.50
Non-Holdback, Cast Iron, gro $7@7.50
J. Bardsley
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Spring Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 45%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass ..... 30&5%
American 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable, No. 7 ..... $12.00
Gem new list 30%
Clover Leaf ..... ₱ gr. $ 2.50
Oxford new list 30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $9.50
Lawson Mfg. Co.:
Matchless 35%
Matchless Pivot 45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge 40%
Chief Ball Bearing Floor Hinge .45%
Royal Ball Bearing Floor Hinge .. 45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 45%

Extra 5&10% often given.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901: *60&10&10&5%*
Light Strap Hinges 70%
Heavy Strap Hinges .. 75&10%
Light T Hinges ..... 65%&5%
Heavy T Hinges ..... 60&5%
Extra Heavy T Hinges 75%
Hinge Hasps 55%
Cor. Heavy Strap ..... 75&10%
Cor. Ex. Heavy T 75%
Screw Hook and Strap: *6 to 12 in ..... lb. 3½c*; *1¼ to 20 in ..... lb. 3½c*; *22 to 36 in ..... lb. 3 c*
Screw Hook and Eye:
¾ to 1 inch ..... lb. 5 c
⅝-inch ..... lb. 6 c
½-inch ..... lb. 7 c

Extra 5&10&10&5% @ 60&10&10&5%

Miscellaneous—

Hoffman's Steel Spring Butt Hinges ..... 40&10%
Hoffman's Offset Refrigerator Hinges .. 40&10%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers 35%

Hods, Coal—

	15 inch.	*16 inch.*	*17 inch.*	*18 inch.*
Galv. Open	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar ..... each $1.45
Steel Brick ..... each $1.10
Hoffman's:
Brick ..... each $1.10
Mason's ..... each $3.00
Plasterers' ..... each $3.20

Hoes— Eye—

Scovil and Oval Pattern ..... *60@10@60@10@10%*
Grub, list Feb. 23, 1899 .... *70@70@10%*

Handled—

Aug. 1, 1899, List:
Garden ..... 70&10%
Meadow & Rhode Island 75&2½%
Southern Meadow ... 75&5&2 %
Mortar and Street ..... 75&7½%
Planters', Regular Pat'n. 70&30%
Cotton ..... 75&7½%
Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco. 70&10&5%

Extra 30%

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Cotton Hoe ..... 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $5.00
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.60
Ft. Madison Dixie Tobacco Hoe. 75&20%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Empire 50%

File and Tool—

Nicholson File Holders and File Handles 33⅓%

Hooks— Cast Iron—

Bird Cage, Reading 60%
Bird Cage, Sargent's List 60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List ..... 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List ..... 45&10%
Clothes Line, Stowell's 70%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading ..... 70@75%
Coat and Hat, Wrightsville 65%
Harness, Hoffman ..... per doz. 35@40¢
Harness, Reading List ..... 70&10@75%

Wire—

Belt *80%*
Wire C. & H. Hooks. 60&10@60&10&10%
Atlas, Coat and Hat:
Single Cases 50%
10 Case Lots ..... 50&10%
Czar Harness ..... 50&10&5%

Wire Coat and Hat:
Acme 60%
B. B. 60%
V Brace, Chief and Czar 60%
Gem 60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass ..... Nos. 1 2 3 4
Best $1.50 1.75 2.00
Common $1.30 1.30 1.50 1.60
Potato and Manure ..... 65%&20%
Whittletree ..... lb. 5½c
Hooks and Eyes:
Brass ..... 60&10&10@70%
Malleable Iron ..... 70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Ft. Madison Cut-Easy Corn Hooks, ₩ doz. $5.25 net
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition ..... ft. 4¼@ 4½c
3-ply Standard ..... ft. 6 @ 6½c
4-ply Standard ..... ft. 7½@ 8 c
3-ply extra ..... ft. 8½@ 9 c
4-ply extra ..... ft 10½@11 c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 6 @7 c
Fair quality ..... ft. 8 @9 c

Irons— Sad—

From 4 to 10 ..... lb 2¾@3c
B. B. Sad Irons ..... lb. 3@3¼c
Chinese Laundry ..... lb. 4¼@5c
Chinese Sad ..... lb. 3¾@4c
Mrs. Potts', per set:
Nos. 50 55 60 65
Jap'd Tops 71c 71c 81c 81c
Tin'd Tops 77c 77c 87c 87c
New England Pressing lb. 3¾@3½c

Pinking—

Pinking Irons ..... doz. 50@60c

Soldering—

Soldering Coppers 2¼ and 3 .. 18@19
1½ and 2 ..... 20@21c
Covert Mfg. Co ..... 20&2%

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&5%
Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport 50%
Lane's Steel ..... 30&10%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c 30%
Hartzell Cutlery Co 50%
Smith & Wemeway Co ..... 40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₩ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... 70&5@70&10%
Bradley's ..... A
C. E. Jennings & Co. Nos. 45, 46 .60&10%
Jennings & Griffin. Nos. 51, 52 .60&10&10%
Swan's ..... 70&10&2½%
Watrous ..... 16⅔&10%
L. & I. J. White ..... 20&5@25%

Hay and Straw—

Lightning ..... ₩ doz. $6.50@7.00
Iwan's Sickle Edge ..... ₩ doz. $10.00
Iwan's Serrated ..... ₩ doz. $10.00
Maine ..... ₩ doz. $8.50

Mincing—

Buffalo ..... ₩ gro. $13.00

Miscellaneous—

Farriers' ..... doz. $2.00@3.00
Woosenholm's ..... ₩ doz. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro ..... $1.10@1.30
Carriage, Jap, all sizes .. gro. 25@30c
Door, Mineral ..... doz. 65@70c
Door, Por. Jap'd ..... doz. 70@75c
Door, Por. Nickel .... doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c .. 15%
Picture, Sargent's ..... 60&10%

Lacing Leather—

See *Belting Leather—*

Ladders Step Etc.—

Lane's Store 25%
Myers Noiseless Store Ladders 30%

Ladies— Melting—

L. & G. Mfg. Co 25%
P. S. & W ..... 5&5%
Reading 60%
Sargent's ..... 45&10%

Lanterns— Tubular—

Regular Tubular No. 0 .. doz. $4.25@4.75
Lift Tubular .. No. 0 .. doz. $4.75@5.25
Hinge Tubular. No. 0 .. doz. $4.75@5.25
Other Styles ..... 40&10%40&10&5%

Bull's Eye Police—

No. 1 2¾ inch ..... $2.50@2.75
No. 2, 3 inch ..... $3.75@5.00

Latches— Gate—

Hoffman's Safety Gate ..... ₩ doz. 60c

Thumb—

Roggin's Latches, with screw .. doz 35@40c

Leaders. Cattle—

Small ..... doz. 55c; large, 60c
Covert Mfg. Co ..... 45&2%

Lifters, Transom—

R. & E. 33⅓%

Lines—

Wire Clothes, Nos... 18 19 20
100 feet $2.20 2.00 1.65
75 feet $1.80 1.70 1.30
Ossawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 .... 10%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $5.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 30%
Anniston Waterproof Clothes, 50 ft., ₩ gro.: $22.00; Gilt Edge, $30.00; Air Line $20.00; Acme, $15.00; Alabama, $15.00; Bridgeport, $13.50; Advance, $13.50; Alliston, $11.50; Calhoun, $10.00; Oriole, $30.00; Albermarle, $25.50; Eclipse, $11.00; Chicago, $10.00; Standard, $9.00; Columbia, $8.00.

Locks— Cabinet—

Cabinet Locks ..... 33⅓&@33⅓&@71⅓%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co 50%
R. & E. Mfg. Co 40%
Sargent & Co ..... 40@40&10%

Elevator—

Stowell's 40%

Padlocks—

Wrought Iron ..... 75&10&5@50&5%
R. & E. Mfg. Co. Wrt. Steel and Brass .. 75@75&10%

Sash, &c.—

Ives' Patent.:
Bronze and Brass ..... 55&7½%
Crescent 50%
Iron ..... 60&2½%
Wrought Bronze and Brass ..... 50&5%
Wrought Steel 55%
Reading ..... 60&10&10@70%

Machines— Boring—

Com., Upright, Without Augers .. $2.00
Com., Angular, Without Augers .. $2.25
Without Augers.
R. & E. Mfg. Co.: Upright. Angular.
Improved No. 3 $4.25 No. 1 $5.00
Improved No. 4. 3.75 No. 2 3.38
Improved No. 5. 2.75
Jennings'.. No. 4, 3.15 No. 1, 3.50
Millers' Falls 5.75
Snell's, Rice's Pat. 2.50 2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist 25%

Ice Cutting—

Chandler's ..... 15&10%

Washing—

Boss Washing Machine Co.: Per doz.
Boss No. 1; Boss Rotary $57.00
Boss No. 7; Dietz Rotary $60.00
Champion Rotary; Banner No. 1.. $54.00
Standard Champion No. 1 ..... $48.00
Standard Perfection $26.00
Cinti Square Western $30.00
Uneeda American, Round $29.00

Mallets—

Hickory ..... 55&5@50%
Lignumvitæ ..... 55&5@50%
Tinners', Hickory and Applewood, doz ..... 50@55c

Mats— Door—

Elastic Steel (W.G. Co.) 10%

Mattocks—

See *Picks and Mattocks.*

Menders Hose

Robinson's Hose Menders .... ₩ gro, $2.00

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—

Enterprise Mfg. Co ..... 25@30%
Hoffman's Side, Coffee and Spice .... ₩ doz. $1.25
National, list Jan. 1, '04 ..... 30%
Parker's Columbian & Victoria. 50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros Co 30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap ..... all sizes. $1.90@1.95
Good ..... all sizes, $2.25@2.50

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00
Continental				60&10%
Great American				7 %
Great American Ball Bearing				60&10%
Quaker City				70%
Pennsylvania				60&10%
Pennsylvan a Ball Bearing				60&5%
Pennsylvania Golf				50%
Pennsylvania Horse				40%
Pennsylvania Pony				45%

Philadelphia:
Styles M., S., C., K., T. ..... 70&10%
Style A, all Steel ..... 65&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list... 50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 ..... 85c 10c 10@85c 10& 10d 10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25c	23c	22c	21c	21c	40&5%
Ausable	28c	28c	25c	24c	23c	50&10%
C. B. K.	25c	25c	22c	21c	21c	40%
Champ'in	28c	26c	25c	24c	23c	40&10&5%
Clinton	19c	17c	16c	15c	14c	30&10&5%
Maud S.	25c	23c	22c	21c	21c	50%
Putnam	23c	21c	20c	19c	18c	33⅓%
Putnam						
Cold Rol'd	19c	18c	17c	16c	..	10&10%
American. Nos. 5 to 10						₩ lb. 9@9½c
Nonpareil	Nos. 5 to 10					₩ lb 12c
Jobbers' special brands .. per lb. 8@9c						

Picture

	1½	2	2½	3	3½ in.
Brass Head	.85	.90	.95	1.00	gro.
Por. Head	..	1.10	1.10	1.10	.. gro.
Crown Picture Nails					₩ gro. $1.50

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain $4.50
Hexagon, plain $4.60
Square, C. T. & R $4.70
Hexagon, C. T. & R $5.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank $4.50
Hexagon Blank $5.00
Square Tapped $4.60
Hexagon Tapped $4.80

Oakum—

Best or Government ..... lb. 6¼c
Navy ..... lb. 4½c
U. S. Navy ..... lb. 5½c
Plumbers' Spun Oakum 2¾c
In carload lots ¼c lb. off f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper ..... 65@65&10%
Tin or Steel ..... 70&10@75%
Zinc ..... 75@75&10%
Chase or Paragon:
Brass and Copper .... 65&5@65&10%
Tin or Steel ..... 75@75&10%
Zinc ..... 76@76&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Ame'ican Tool & Stamping Co.:
Spring Bottom Cans ..... 70&70&10%
Railroad Oilers etc ..... 60@60&10%

Openers— Can—

French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle .. per doz 35@40c
Sardine Scissors .. doz. $1.75@$3.00
Marvel ..... per doz. $1.25
National 50%
Stowell's ..... per doz. 35@45c
Tip Top ..... per doz. $0.75

Egg—

Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—

Sheet, C. I. ..... 8@12c
Sheet, C. O. S. ..... 9@13c
Sheet, C. B. S. ..... 10@14c
Sheet, Pure Gum ..... 50@70c
Sheet, Red ..... 35@40c
Jenkins' Standard, ₩ lb 80c .... 25@25&5%

Miscellaneous—

American Packing ..... 7@10c lb.
Cotton Packing ..... 13@15c lb.
Italian Packing ..... 9@12½c lb.
Jute ..... 3½@4c lb.
Russia Packing ..... 7@11c lb.

Pails— Creamery

S. S. & Co., with gauges .. No 1 $6.25; No. 2, $5.50 ₩ doz.

Galvanized—

Price per doz.

	Quart	10	12	14
Water, Regular		1.75	2.00	2.25
Water, Heavy		2.75	3.00	3.25
Fire, Rd. Bottom		2.30	2.60	2.80
Well		2.25	2.50	2.75

Pans— Dripping—

Standard List ..... 60c @60&10%

Fry—

Common Lipped:

No.	1	2	3	4	5
Per doz.	$0.95	1.05	1.15	1.30	1.65

Roasting and Baking—

Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Simplex, ₩ doz.:

No.	40	50	60	140	150	160
	$2.75	3.25	3.75	3.00	3.25	4.00

Paper—Building Paper—

Asbestos:	*lb.*
Building Felt	2¾c
Mill Board, sheet, 40 x 40 inches	3½c
Mill Board, roll, thicker than 1-16 inch	3½c
Mill Board, roll, 1-16 in. thick and less	2½c

	Per roll
Rosin Sized Sheathing: 500 sq. ft.	
Light wt., 25 lbs. to roll	$0.45@0.50
Medium wt., 30 lbs. to roll	$0.58@0.65
Heavy wt., 40 lbs. to roll	$0.68@0.75
Medium Grades Water Proof Sheathing	$0.65@1.25
Deafening Felt, 2, 6 and 4½ sq. ft. to lb., ton	$45.00
Red Rope Roofing, 250 sq. feet per roll	$1.65

NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 240 sq. ft.), ton .. $32.50@35.00
2 ply, roll 108 sq. ft ..... 60@65c
3 ply, roll 108 sq. ft ..... 82@87c
Slater's Felt (roll 500 sq. ft.) 75c
NOTE.—*Above prices often include delivery.*
R. R. W. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint ..... 60&10&10%
Garnet ..... 25@25&10%

Parers— Apple—

Advance ..... ₩ doz. $4.50
Baldwin ..... ₩ doz. $5.00
Bonanza Improved ..... each $6.50
Dandy ..... each $7.50
Eureka Improved ..... each $20.00
Family Bay State ..... ₩ doz. $15.00
Improved Bay State ..... ₩ doz. $36.00
New Lightning ..... ₩ doz. $7.50
Reading 72 ..... ₩ doz. $4.00
Reading 78 ..... ₩ doz. $7.00
Turn Table '98 ..... ₩ doz. $6.75
White Mountain ..... ₩ doz. $6.00

Potato—

Saratoga ..... ₩ doz. $7.00
White Mountain ..... ₩ doz. $6.00

Paris Green—

Less than 1 ton, per lb.
Arsenic kegs or cases 12½c
Kegs, 100 to 175 lbs ..... 13 c
Kits, 14, 28, 56 lbs ..... 14 c
Paper boxes, 2 to 5 lbs ..... 14 c
Paper boxes, 1 lb 14½c
Paper boxes, ½ lb ..... 15 c
Paper boxes, ¼ lb ..... 16 c
1 to 5 tons, 1 cent per lb. less: 5 tons and over, 1½ cents per lb. less.

Picks and Mattocks—

List Feb. 23, 1899 ..... 65&10@70%

Pinking Irons—

See *Irons, Pinking.*

Pins— Escutcheon—

Brass ..... 60@60&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—

Standard, 2-6 in ..... 50&10%
Extra Heavy, 2-6 in 65%
Fittings 70%

Pipe, Merchant,

Steel or Iron, Carload Lots, f.o.b, Pittsburgh.

Merchant Pipe.	*Black.*	*Galvanized.*
½, ¾, ⅝ inch	63%	58%
¼ inch	70%	60%
¾ to 6 inch	75%	65%
7 to 12 inch	73%	68%

Less than carloads, 12½% advance.

Pipe Sewer—

Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England 70%
New York and New Jersey 75%
Maryland, Delaware, East Penn. 75%
West Penn and West Va 70%
Virginia 75%
Ohio, Michigan and Ky 78%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.50	$8.50
6 in., per 100 joints	8.00	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—

Wood Planes—

Bench, First quality .... 40&5@40&10%
Bench, Second qual .... 50&5@50&10%
Molding ..... 33⅓&5@33⅓&10%
Bailey's (Stanley R. & L. Co) ..... 5&10@25&10&10%
Gage Self Setting 35%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Sargent's 60%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 50&5@50&10%
Buck Bros 30%
Stanley R. & L. Co .. 20&10@20&10&10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₩ doz. $8.50

Plates—

Felloe ..... lb. 3¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 75@75&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe .. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 50@50&5%
Bernard's:
Parallel Pliers 95%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 50&5%
Elm City Fence Pullers 35%
Cronk & Carver Mfg. Co.:
American Butte ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Bub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10&10&10&10%
P., S. & W. Tinners' Cutting Nippers, 30&30&10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Disston's Plumbs and Levels 70%
Disston's Pocket Levels 70%
C. E. Jennings & Co.'s Iron ..... 25&10%
C. E. Jennings & Co.'s Iron, Adjustable ..... 33⅓&10%
Stanley R. & L. Co ..... 40@40&10&10%
Stanley's Duplex ..... 20@20&10&10%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz. No. 1, $8.00; No. 2, $10.00; No. 3, $12.00; No. 4, $12. 0 ..... 50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 8½c@..
¼-lb. papers..... lb. ..c@..
½-lb. papers..... lb. 9 c@..

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.10

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's..... 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72..... 40%
Prestoline Paste..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz..... $3.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00..... 50%
Joseph Dixon's, ₱ gr. $5.75..... 10%
Dixon's Plumbago..... ₱ lb 8¢
Fireside..... ₱ gr. $2.50
Gem, ₱ gr. $4.50..... 10%
Japanese..... ₱ gr. $3.50
Jet Black..... ₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail..... each 70¢
Black Silk, ½ lb box..... ₱ doz. $1.00
Black Silk, 5 oz. box..... ₱ doz. $0.75
Black Silk, ½ pt. liq..... ₱ doz. $1.00

Poppers, Corn—

1 qt., Square..... gro. $9.00
1 qt., Round..... gro. $10.00
1½ qt., Square..... gro. 11.00
2 qt., Square..... gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 8 ft., 58¢.
Steel Hitching Posts, each..... $1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled..... 40%
Tinned..... 45%

Powder—

In Canisters:
Duck, 1 lb. each..... 45c
Fine Sporting, 1 lb. each..... 75c
Rifle, ½-lb. each..... 15c
Rifle, 1-lb. each..... 25c
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk)..... $3.50
Quarter Keg (6¼ lb bulk)..... $1.90
Case 24 (1 lb cans bulk)..... $8.50
Half case (1 lb cans bulk)..... $4 50

King's Smokeless:	Shot Gun	Rifle
Keg (25 lb bulk).....	$12 00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17 00
Half case (1 lb cans blk)	7.25	8 75

Robin Hood shot Gun..... 50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co..... 20@25%
Sensible..... 33⅓%
2 qt., $2.00, 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20 00..... 50%
Morrill's No. 2, per doz. $22 50..... 50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops..... 50%
Miller's Falls, No. 3, per doz. $12.00.. 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50..... 50%
Pelican, ₱ doz. $9.00..... 40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $5.50; No. 2 (large), $5.75; No. 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4 50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax..... 60%
Diamond B, No. 2, ca e lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka..... 50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15..... 40%
Yankee..... 66⅔%

Pulleys—Single Wheel—

Inch	*2*	*2½*	*3*
Awning, doz	*$0.50*	*.75*	*1.00*

Hay Fork, Swivel or Solid Eye..... doz., 4 in., $0.95; 5 in., $1.25

Inch	*2*	*2¼*	*2½*
Hot House, doz	*$0.60*	*.80*	*1.10*
Inch	*1¼*	*1½*	*1¾*	*2*
Screw..... doz.	*$0.14*	*.17*	*.20*	*.26*
Inch	*1¾*	*2*	*2¼*	*2½*
Side..... doz	*$0.27*	*.35*	*.43*	*.55*
Inch	*1½*	*1¾*	*2*	*2½*
Jackle... doz.	*$0.27*	*.37*	*.50*	*.69*

Stowell's:
Ceiling or Fall, Anti-Friction..... 60%
Dumb Waiter, Anti-Friction.. 60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 50%
Electric Light..... 60%
Side, Anti-Friction..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ in., 13c; 2 in., 16c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.
Acme..... 1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in. ₱ doz 25¢
No. 9, 1¾ in..... ₱ doz. 20¢
Extra for Plated Finish..., ₱ doz. 20¢
Extra for Anti-Friction Br nze Bushing..... ₱ doz 10¢
Grand Rapids All Steel Noiseless.... 40%
Ideal No. 13..... 1¾ in.. ₱ doz., 16¢
Niagara..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy.... 1¾ in., 14½¢; 2 in., 16½¢
Star..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern..... 60@60&10%
Pitcher Spout..... 75&10@80%
Wood..... 50@5 &10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list)..... 50%
Contractors' Rubber Diaphragm No. 2 R. & L. Block Co..... $16.00
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout..... 75%
Loud's Suction Pumps, U. S. Co..... 20%
Myer's Pumps, low list..... 50%
Myers' Power Pumps..... 50%
Daisy Spray Pump..... ₱ doz. $7.50
Myers' Spray Pumps..... 50&10%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.75@4.00
Bemis & Call Co.'s Cast Steel Drive.... 50%
Bemis & Call Co.'s Check..... 55%
Bemis & Call Co.'s Spring..... 50%
Morrill's No. 1 (A. B. C.), ₱ doz., $15.00 .50%
No. 2, ₱ doz. $22.50..... 50%
No. 2, Metal, ₱ doz., $45.00..... 50%
Bench Punch, each, $40.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Steel Screw, B & K. Mfg Co..... 40%
Tinners' Hollow, P., S. & W. Co. 35@3 &5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44..... 60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

⅛	*⅝*	*¾ in.*
$1.70	*$2.10*	*$3 00 100 feet*

Angular for Sq. Groove Wheels:

Small	*Med.*	*Large.*
$1.60	*1 95*	*2.70*	*100 feet.*

Sliding D or Brnzed Wr't'l on ft. 6½c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1⅛ in..... lb. 30c.. 30%
Allith Mfg. Co. Reliable Hanger Track ₱ foot..... 10¢
Cronk's Double Braced Steel Rail, ₱ foot..... 3½¢
Cronk's O. N. T. Rail..... 3½¢
Lane's O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $4.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft..... 3.75
Lawrence Bros.' ₱ ft. 4¼¢
Lawrence Bros. New York..... 3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11c..... 50%
McKinney's None Better..... ₱ ft. 3½¢
McKinney's Stan ard ..... ₱ ft. 4 c
Myers' Stayon Track ..... 50&10%
Smith's Wrought Bracket, Plain.... 3½¢
Smith's Special ..... 4½¢
Smith's Never-Jump, per ft. 11c..... 50%
Smith's Plain Steel 30%
Smith's Milled Steel..... 4½¢
Stowell's Cast Rail..... 1½¢
Stowell's Steel Rail, Plain..... 25%
Stowell's Wrought Bracket, Plain.. 3½¢
Swett's Hylo, per ft. 11c..... 50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $8.00

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank.....	*$1.50*	*1.60*	*1.75*	*1.85*
Socket.....	*$1.65*	*1.80*	*1.95*	*2.10*

Steel, August 1, 1899, List.....0 &5&20%
Malleable..... 70&10@75&5%
Lawn Rake s, Metal Head, per doz., 20 teeth..... $3.25@3.50
24 teeth..... $3.60@3.75
Fort Madison Red Head Lawn..... $3 25
Fort Madison Blue Head Lawn..... $3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz..... $3 45
Lawn Queen, 24-tooth, ₱ doz..... $3.60
Paragon, 20 tooth, ₱ doz..... $2.75
Paragon, 24-tooth, ₱ doz..... $3.00
Steel Garden, 14-tooth, ₱ doz. $2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Diston's..... 75%
Heller Bros..... 70&5@10&10&5%
McCafferty's American Standard..... 60&10&5%
New Nicholson..... 50&10%
see also *Files.*

Razors—

Borastic..... 60 & 10%
Fox Razors, No. 42, ₱ doz. ($20.00) 5% 10%
Fox Razors, No. 44, ₱ doz, ($20.00) 5% 10%
Fox Razors, No. 8., Platina, ₱ doz.) 5% 10%
..... =25.0
Red Devil..... 60%
Silbersie n: $18.00
Carbo Magnetic..... $18.00
Griffon, No. 65..... $15.00
Griffon, No. 66..... $12.00
All other Razors..... 40%
Safety Razors..... 40%

Safety Razors—

New Gem, in Tin Boxes..... ₱ doz $12.00
New Gem Extra Blades ..... ₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.) ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case..... ₱ doz. $27.00

Reels— Fishing—

Bishop's Independent Fish Reel Spool er, ₱ doz..... $30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9½ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 9A N, 6 N, 4 N to 8 PN, ... 33⅓%
6 RW, 102 P and RN, 202 P and I PN. 40%
G 9..... 20%
24 N to 28 PN..... 35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and I PRN, 202 PR and PRN.... 50&5%
2904 N..... 40& 0&5%
5009 P and N..... 50%
2904 P..... 50&10&5%
2904 PN..... 60%
0924 N..... 40&10%
02084 N..... 45&1 &5%
Single Action Trout..... 40&10%
9-6 P N 80 and 102 N..... 0&10%
Compound or, 304 and 1304 PN..... 35%
6094 P and I PN..... 40&5%
Safety and Salmon..... 30%

Registers—*List Sept. 2, 1901.*

Black Jap
White Jap
Bronzed
Nickel Plated
Electro Plated } 75&10 @50%

There is a good deal of irregularity in prices of Registers.

Revolvers—

Single Action..... .85@90c
Double Act n, except 44 cal..$1.45@1.50
Double Action, 44 caliber..$1.60@1.65
Automatic..... $2 75@3.00
Hammerless..... $3.25@3.50

Riddles, Grain or Sand—

16 in., per doz..... $2.75@3.00
17 in., per doz..... $3.00@3.25
18 in., per doz..... $3.25@3.50

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 Inch.*
Steel..	*$0 70*	*0.75*	*0.80 doz.*
Copper..	*1.00*	*1.10*	*1.35 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron, doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers..per doz. $0.75@1.00

Rivets and Burrs—

Copper..... 50&10@50&10&5%
Iron or Steel:
Tinners'..... 75@75&10%
Miscellaneous..... 75@75&10%

Rollers—

Acme, Stowell's Anti-Friction..... 50%
Barn Door, Sargent's list..... 60%
Cronk's Stay..... 60&5%
Cronk's Brinkerhoff..... 66⅔%
Lane's Stay..... 33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger, tarred or untarred...lb. 11 @11½c
Manila, ⅜-inch .. lb. 11½@12 c
Manila, ¼ & 5-16 in... lb. 12 @12½c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 12 @12½c
Sisal, 7-16 in. and larger lb. 8 @10 c
Sisal, ⅜-inch .. lb. 8½@10½c
Sisal, ¼ and 5-16 inch..lb. 9 @11 c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 8 @10 c
Sisal, Tarred, Medium Lath Yarn..... lb. .7½@ 9½c
Cotton Rope:
Best ..½-in. and larger, lb. 13½c
Medium..¼-in. and larger, lb. 11 c
Com ....½-in. and larger, lb. 9 c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Yarn, ¼-in. and up.. lb. 5 @5½c
Old Colony Manila Transmission Rope, ₱ lb 17½¢

Wire Rope—

Galvanized..... 40&5%
Plain..... 45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute..... 40&5%
Sisal..... 30%
Covert Saddlery Works..... 60&5%

Rules—

Boxwood..... .60&10@60&10&5%
Ivory..... 35&10@35&10&5%
Ivory..... 35&10@35&10&5%
Patent Combination..... 55@55&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 60&10%
Stanley R. & L. Co.:
Boxwood..... 60@60&10%
Ivory..... 35@ 5&10& 0%
Upson Nut Co.:
Boxwood..... 60@60&10%
Ivory..... 35&10@35& 0&10%

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular..... 50%&50&10%
Band..... 50& 0&60%
Cross Cuts..... 35&5%
Mulay, Mill and Drag..... 50&10%
One-Man Saw..... 40%
Wood Saws..... 40%
Hand, compass, &c..... 40%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws..... 25%
Diston's:
Circular, Solid and Inserted Tooth 50%
Band, 3 to 14 in. wide..... 60%
Band, ¼ to 2¾..... 70%
Crosscuts..... 45%
Narrow Crosscuts..... 50%
Mulay, Mill and Drag..... 50%
Framed Woodsaws..... 35%
Woodsaw Blades..... 35%
Woodsaw Rods..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
Compass, Keyhole, &c..... 25%
Butcher Saws and Blades..... 35%
C. E. Jennings & Co.'s.:
Back Saws..... 25&10%
Butcher Saws..... 3 &10%
Compass and KeyHole Saws.35&5&10%
Framed Wood Saws..... 30&10%
Hand Saws..... 20&2½&10%
Wood Saw Blades..... 30&10%
Millers Falls:
Butcher Saws..... 15&10%
Star Saw Blades..... 15&10%
Peace:
Circular and Mill 50%
Cross Cuts, list Jan. 1, '99..... 50%
Hand, Panel and Rip..... 30%
Richardson:
Circular and Mill 50%
Hand, &c..... 30%
X Cuts, list Jan. 1, '99..... 50%
Simonds:
Circular Saws..... 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts..... 40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws... ..... 50%
Back Saws..... 25@25&7½%
Butcher Saws..... 35@35&7½%
Hand Saws..... 25@25&7½%
Hand Saws, Bay State Brand..... 25%
Compass, Keyhole, &c ..... 25@25&7½%
Wood Saws..... 35@35&7½%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 30%
Disston:
Concave Blades..... 25%
Keystone..... 40%
Hack Saw Frames..... 30%
Fitchburg File Works, The Best..... 25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades..... 35&5&10%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades..... 25%
Sterling Hack Saw Frames..... 20%

Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scalers, Fish—

Bishop's Lightning..... ₱ doz. $3 00
Covert's Saddlery Works..... 60&10%

Scales—

Family, Turnbull's..... 30@30&10%
Counter:
Hatch, Platform, ½ oz to 4 lbs, doz. $5.50
Two Platforms, ½ oz to 8 lbs, doz. $16
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka..... 25%
Favorite..... 40%
Grocers' Trip Scales..... 50%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing 50%
"The Standard" Portables..... 45%
"The Standard" R. R. and Wagon..... 50%

Scrapers—

Box, 1 Handle..... doz. $2.25@2.50
Box, 2 Handle..... doz. $3 00@3 50
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co.) $6.00..... 30&30&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen.. 60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.... 60&60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens ..... 60&5@60&5&2½%
Hummer Window Screens ..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in., $2.75@3.00; 1¼, $3.25@3.50; 1¼, $3.85@4.25
Bench, Wood, Beech..doz. $3.00@3.50
Hand, Wood.....30@50&5%
Hand, R. Hds Mfg. Co.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....70&15@...%
Coach and Lag, Gimlet Point, list Oct. 1 '99.....70&10@...%
Hand Rail, list Jan. 1, '81.00&10@...%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&10%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@55&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel).....70%
Sq. Hd. Cap.....65%
Hex. Hd. Cap.....65%
Rd. or Fillister Hd. Cap.....60%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts:
Flat Head, Iron.....87½&10@...%
Round Head, Iron.....85&10@...%
Flat Head, Brass.....85&10@...%
Round Head, Brass..50&10@...%
Flat Head, Bronze....77½&10@...%
Round Head, Bronze.....75&10@...%
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes—*Per doz.*

Clipper Pattern, Grass...$5.50@$5.00
Full Polished Clipper.....$5.0@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Wood and Bush.....$4.75@$5.00

Seeders—Raisin—

Enterprise.....25@30%

Sets—Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 1¼ Awls, 6 Tools doz. $2.50@2.60
Aiken's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18.....15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&30&10&10%

Garden Tool Sets—

Ft. Wayne Combination, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted.....gro. $1.80@2.50
Octagon.....gro. $4.00@4.25
Annurled, Good.....gro. $5.75@6.00
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70&10@75%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's:
Criterion.....40%
Adjustable.....40%
Bemis & Co.'s:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 9½, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut.....₱ doz. $9.00
Royal, Hand.....₱ doz. $5.40
Taintor Positive, ₱ doz. $18.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

Shaves Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.65@2.25
Bailey's (Stanley R. & L. Co.).....50@50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's Fl and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heintsch's Tailo s' Shears.....40%
Wilkinson's Hedge.....1900 list 45%
Wilkinson's Pruning.....40%
Wilkinson's Sheep.....1900 list. 25%

Tinners' Snips—

Steel Blades.....20&5@20&10
Steel Laid Blades.....40&10@45%
Forged Handles, Steel Blades, Berlin.....40@40&10%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 inch.....40&7½&10%
Niagara Snips.....40%
P., S. & W. Co.....20%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓&5%
Cronk's Pruning Shears.....33⅓&5%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz. $12.00.....25%

John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓&5%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....30%
Patent Roller Hatfield's, Sargent's list.....70&10%
Reading.....70&10@75%
R. & E. list.....33⅓&5%
Wrightsville Hatfield Pattern.....30%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓&5%
Sargent's list.....50&10%

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.....65&5%

Paper Shells, Empty:
Acme; Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....30&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder.....40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood, Low Brass.....50%
Robin Hood, High Brass.....30&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.50
Drop, B and larger, per 25-lb. bag $1.75
Buck, 25-lb. bag.....$1.75
Chilled, 25 lb. bag.....$1.75
Dust Shot, 25-lb. bag.....$2.00

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00.....90%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size	*$1.20*	*1.25*	*1.30*	*1.35*
Plated, full size	*$1.30*	*1.35*	*1.40*	*1.45*
Black, scant	*$0.85*	*1.00*	*1.05*	

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.65@0 75
Mesh 20, Nested, doz.....75@ .85
Mesh 24, Nested, doz.....90@1.00

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins Wagon—

Cast Iron.....70@70&10%
Malleable Iron.....40&10@50%
Steel.....40@40&10%

Slates, School—

Factory Shipments.

"D" Slates.....45%
Noiseless Slates.....60&4 tens &5%
Wire Bound.....40%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No. 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Leroy.....30&5&2%
High Grade.....45%
Hockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60
Triumph.....60%
Oneida Community:
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded.....66⅔&10%

Snaths—

Scythe.....50@50&1 %

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&10&5%
Cheap.....60@60&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor Rogers Brand.....40%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60@60&10%
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. Rogers Co.:
German or Nickel Silver, Special list.....l. &10%

Tinned Iron—

Teas.....per gro. 45@55c
Tables.....per gro. 90c@$1.00

Springs—Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider:
Black or ¼ Bright, lb.....5¼c
Bright, lb.....5½c
Painted Seat Springs:
1½ x2x 26, per pr.....50@55c
1½ x 2 x 28 per pr.....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@30%
Macksey.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.....List Jan. 5, 1900.
Steel and Iron.....70&10%
Rosewood tidi Try Square and T-Bevels.....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels, 40&10@40&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter.....40&10@40&10&10%

Squeezers—Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined Cheap.....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2.90@3.25

Staples—

Barbed Blind.....lb. 6@6¼c
Electricians', Association list.....80&10&10&10%
Fence Staples, See Trade Report, Galvanized, 15c less than Barb Wire Polished 20c less than Barb Wire.
Poultry Netting, Staples....per lb..2¼@2¾c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....60&5%
C. & A. Hoffmann's.....40%

Steelyards.....35&10@30&10%

Stocks and Dies—

Blacksmiths'.....40&10@50%
Curtis Reversible Ratchet Die Stock..25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25&30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Pike Mfg. Co. 1901 list:

	₱
Black Diamond S. S....	₱ gro. $12.00
Lamoille S....	₱ gro. $11.00
White Mountain S. S....	₱ gro. $9.00
Green Mountain S. S....	₱ gro. $6.00
Extra Indian Pond S. S.	₱ gro. $7.50
No. 1 Indian Pond S. S.	₱ gro. $7.00
No. 2 Indian Pond S. S.	₱ gro. $4.50
Leader Red End S. S....	₱ gro $4.50
Balance of 1901 list	33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

	₱
Arkansas Stone, No. 1, 3 to 5¼ in.	$2.80
Arkansas Stone, No. 1, 5¼ to 8 in.	$3.50
Arkansas Slips No. 1.....	$4.00
Lily White Washita 4 to 8 in....	60¢
Rosy Red Washita, 4 to 8 in....	60¢
Washita Stone, Extra, 4 to 8 in..	50¢
Washita Stone, No. 1, 4 to 8 in..	40¢
Washita Stone, No. 2, 4 to 8 in..	30¢
Lily White Slips.....	90¢
Rosy Red Slips.....	90¢
Washita Slips, Extra.....	80¢
Washita Slips, No. 1.....	70¢
India Oil Stones (entire list).....	3 ⅓%

Hindostan No. 1, Regular....	₱ ℔ 8¢
Hindostan No. 1 Small.....	₱ ℔ 10¢
Axe Stones (all kinds).....	20¢
Turkey Oil Stones, ex. 5 tos in.	₱ ℔ 80¢
Queer Creek Stones, 4 to 8 in....	20¢
Queer Creek Slips.....	40¢
Sand Stone.....	5¢
Belgian, German and Swi ty Razor Hones.....	50%
Natural Grit Carving Knife Hones, ₱ doz.....	$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....	$2.00
Mounted Kitchen Sand Stone, ₱ doz.....	$1.50

Stoners—Cherry—

Enterprise.....25@30%

Stops Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Straps—Box—

Cary's Universal, case lots.....20@10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60¢
Socket.....doz. $1.70

Stuffers Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Supports, Perch—

Hoffman's Perch Supports....₱ doz. 25¢

Sweepers, Carpet—

National Sweeper Co.:	Per doz.
Marion, Roller Bearing, regular finishes, full Nickel.....	$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel....	$27.00
Monarch, Roller Bearing, Nickel..	$22.00
Monarch, Roller Bearing, Jap'ned.	$20.00
Marion Queen, Roller Bearing, Regular Finishes, full Nickel....	$24.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....	$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....	$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....	$33.00
Perpetual, Regular Bearings, Nickel.	$20.00
Perpetual, Regular Bearings, Jap.	$14.00

NOTE.—*Discount of 50c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

Tacks Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American.....90¢&25¢&5@....%
American Cut Tacks.90¢&20¢&5@....%
Swedes Iron Tacks...90¢&30¢&5@....%
Swedes Upholsterers' Tacks.....90¢&45¢&10¢&5@....%
Gimp Tacks.....90¢&45¢&5@....%
Lace Tacks.....90¢&40@....%
Trimmers' Tacks..90¢&30¢&10¢&5@....%
Looking Glass Tacks....70¢&10@....%
Bill Posters' and Railroad Tacks....90¢&45¢@....%
Hungarian Nails....80¢ 0¢&5@....%
Common and Patent Brads.....80¢&10%
Trunk and Clout Nails..80¢&5@....%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Point Tacks.....90 and 5 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50¢&10@60%
See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.....30-gal	$3.40
Emerald, S. S. & Co.....60-gal.,	$4.25
Queen City S. S. & Co., 45-gal.....	$3.65
Queen City S. S. & Co., 60-gal.....	$4.50

Tapes Measuring—

American Asses' Skin.....40&10@30%
Patent Leather.....25@25&5%
Steel.....40@40&5%
Chesterman's.....25@25&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic.....30&30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, ⅝ inch and larger, per 100 lbs...$3.00

Thermometers—

Tin Case.....80¢&10@90¢&10&5%

Ties, Bale—Steel Wire.

Single Loop.....80@80&10%
Improved, Monitor, Cross Head, Etc.....70%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5 32 x 6½ in., ₱ 1000..$10.00
Galv. Steel 5-32 x 8½ in., ₱ 1000..$11.00
Galv. Steel 5-32 x 11¼ in. ₱ 1000..$12.00
Galv. Steel 5 32 x 15½ in. ₱ 1000..$14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools— Coopers'—
L. & I. J. White ..... 20@20&5%

Hay—
Myers' Hay Tools 50%

Saw—
Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—
L. & I. J. White 25%

Transom Lifters—
See *Lifters, Transom.*

Traps— Fly—
Balloon, Globe or Acme ..... doz. $1.15@1.25; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.25@1.40; gro. $13.00@13.50

Game—
Oneida Pattern ..... 80@80&5%
Newnouse ..... 45&45&5%
Hawley & Norton ..... 65&5&65&10%
Victor (Oneida Pattern) ..... 75&75&5%
Star (Blake Pattern) ..... 60&5&60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3¼, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $3.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $20.00; Mouse, No. 3, $18.00 ..... 50%

J. M. Mast Mfg. Co.:	Per gro. Mouse.	Rat.
Blizzard	No. 12, $5.00	No. 1, $9 50
Old Nick	No. 30, 2.25	No. 2, 8.40
Joker	No. 5, 2 10	No. 3, 8.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2.40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 40%
Wood's K 1 ..... 50%

Trowels—
Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Peace's Plastering 30%
Rose Brick and Plastering ..... 25&5%
Woodrough & McFarlin, Plast'ring 25%

Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$4.75*	*5 25*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

	No. 1	2	3	10	20	30
Per doz.	$5 25	6.00	6.75	6.50	7.00	8.00

Twine—Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*21½c*	*23½c*
No. 12, ¼ and ½ lb. balls	*17½c*	*19½c*
No. 18, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 24, ¼ and ½-lb. Balls	*15 c*	*17 c*
No. 36, ¼ and ½-lb. Balls	*14½c*	*16½c*
Chalk Line, Cotton, ½-lb Balls ..... 22@22½c		
Cotton Mops, 6, 9, 12 and 15 ₱ doz. 8c		
Cotton Wrapping 5 Balls to lb ..... according to quality ..... 11c@17c		
American 2-Ply Hemp, ¼ and ½-lb. Balls ..... 13@14c		
American 3 Ply Hemp, 1-lb. Balls ..... 13@14c		
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 8c		
India 3-Ply Hemp, 1-lb. Balls 8c		
India 3-Ply Hemp, 1½-lb. Balls 7c		
2, 3, 4 and 5-Ply Jute, ½-lb. Balls ..... 8@9c		
Mason Line, Linen, ½-lb. Balls 15c		
No. 264 Mattress, ¼ and ½-lb. Balls 37c		
Wool, 3 to 6 ply ..... 5@5½c		

Binder—

	Cents per lb
Sisal	10¼
Standard	11½
Standard Manila (550 ft.)	11
Manila (600 ft.)	12
Pure Manila (650 ft.)	12¾

F. o. b. Eastern Mill. Carload lots ¼ cent less.

Vises—
Solid Box ..... 50&10@50&10&5

Parallel—
Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 40%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00 net
Pattern Makers' No. 2 ..... $12.00 net
Machinist and Tool Makers' ..... $15.00 net
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' 40%
Keystone ..... 65&5%
Lewis Tool Co. ..... 20@30%
Merrill's 20%
Miller's Falls ..... 50&10&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 ..... 50&5;
Disston's D 8 Clamp and Guide, ₱ doz $30 ..... 25%
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—
Bignall & Keefer Combination Pipe Vise 60%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	*60c*
B. E., 9 and 10	*70c*
B. E., 8	*80c*
B. E., 7	*80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B. E., 11 and larger	*$1.70@1.75*
Ely's P. E., 12 to 20	*$3.00@3.75*

Dis 15%

Ware Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Ground 60%
Unground 65%
White Enameled Ware:
Maslin Kettles 70%
Covered Ware:
Tinned and Turned 40%
Enameled 50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01 ..... 50&10%
Iron Clad Ware ..... 70&10%
Lalor, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettles—
Galvanized Tea Kettles:

No.	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 50%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—
Solid Zinc: ₱ doz
Crescent, family size, beat frame $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.40
Single Zinc Surface:
Salad, family size, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.25
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—

Solid	*.85&10*	*@10@85&10*	*@10@10&10%*		
Patent	*85&10*	*@85&20%*			
Coil:	*¾*	*1*	*1¼*	*1½*	*Inch.*
	9c	*10c*	*11c*	*13c*	*per 100*

Iron or Steel—

Size bolt	*5-16*	*¾*	*½*	*⅝*	*¾*
Washers	*$6.80*	*5.90*	*4.60*	*4.40*	*4.20*

In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.

Cast Washer—
Over ½ inch, barrel lots, per lb. ..... 1¾@2c

Wedges—
Oil Finish ..... lb. 2.90@3.10c

Weights—
Hitching—
Covert's Saddlery Works ..... 60&10%

Sash—
Per ton, f. o. b. factory:
Eastern District $26.00
Western, Central and Southern Districts $27.00

Wheels, Well—
8-in., $1.6 @1.80; 10-in., $2.00@2.25; 12-in., $2.50@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 72½c&5@72½&10%
10 to 18 ..... 72½c@10@72½c@10c&5%
19 to 26 ..... 75c@10c&2½@75c@10c&7½%
27 to 36 ..... 75c@10c&7½@80c@2½%
Galvanized:
6 to 18 ..... 70@70c&5%
19 to 26 ..... 72½c&5@72½c@10%
27 to 36 ..... 72½c@10@72½c@10c&5%
Coppered:
6 to 9 ..... 70c&5@70c@10%
10 to 18 ..... 70c@10@70c@10c&5%
19 to 26 ..... 75c@72½@75c@10c@2½%
27 to 36 ..... 75c@10@75c@10c&5%
Tinned:
6 to 14 ..... 75@75c@7½%
15 to 18 ..... 72½c@75%
19 to 26 ..... 70c&5@70c&5c&5%
27 to 36 ..... 70@70c&5%
Annealed Wire on Spools ..... 70@70c&5%
Brass and Copper Wire on Spools ..... 60@60c&5%
Brass, list Feb. 26, '96 ..... 30@30%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Stubs' Steel Wire ..... $6.00 to $2. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List April 1, 1901 ..... 85c&10c&10@90%

Wire Cloth and Netting—
Galvanized Wire Netting ..... 80@80c&10%
Painted Screen Cloth per 100 ft. $1.15
Light Hardware Grade
2-8 Mesh, Plain (8c. list) sq. ft. ..... 1¾@2c
2-8 Mesh, Galv. (8c. list) sq. ft. ..... 2½@2¾c

Wire, Barb—See *Trade Report.*

Wrenches—
Agricultural ..... 75&5@75c&10c&5%
Baxter Pattern S Wrenches ..... 70c&5@70c&10%
Drop Forged S ..... 45@45c&5%
Acme ..... 60&10%
Alligator 70%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Cylinder or Gas Pipe 55%
Extra Heavy 45%
Merrick's Pattern 50%
No. 3 Pipe, Bright 35%
Boardman's 33⅓%
Coes' Genuine ..... 40&10&5&5%
Coes' "Mechanics" ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Auto ..... 50&5@50&10%
Eagle ..... 50&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots ..... 50&10%
Less than case lots ..... 50&5%
Improved Pipe (W. & B.) 60%
Solid Handles, P. S. & W. ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 50%

Fruit Jar—
Triumph Fruit Can Wrenches, ₱ gro. $19.20
Syrup Cap Wrenches ..... ₱ gro. $8.00
T & B Fruit Jar Wrenches ₱ gro $16.50
T & B Fruit Jar Holders ₱ gro. $30.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 50@50c&5%

Yokes Neck—
Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' ..... list net

Zinc—
Sheet ..... lb 7 @7¼c

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.
Lead, English white, in Oil ..... 7 @ 9½
Lead, American White, in Oil:
Lots of 500 ₱ or over ..... @ 6¼
Lots less than 500 ₱ ..... @ 7¼
Lead, White, in oil, 25 ₱ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ₱ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ₱ assorted tins, add to keg price ..... @ 1½
Lead, American, Terms: For lots 2 tons and over ½¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net
Lead White, Dry in bbls ..... 5½@ 6½
Zinc, American, dry ..... ₱ ₱ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry ..... @ 9¼
Zinc, Antwerp Red Seal, dry ..... @ 7½
Zinc, Antwerp, Green Seal, dry ..... @ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11 @11¼
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.

Black, Carbon	₱ ₱ 6	@ 8
Black, Drop, Amer	4	@ 7
Black, Drop, Eng	7	@11
Black, Ivory	12	@21
Lamp, Com	4½	@ 6
Blue, Celestial	₱ ₱ 4	@ 6
Blue, Chinese	29	@30
Blue, Prussian	27	@30
Blue, Ultramarine	3½	@15
Brown, Spanish	½	@ 1
Brown, Vandyke, Amer	1½	@ 2¼
Brown, Vandyke, Foreign	2½	@ 3
Carmine, No. 40	₱ ₱ $2.	@2.50
Green, Chrome, ordinary	3	@ 6
Green, Chrome, pure	19	@26
Lead, Red, bbls. ½ bbls. and kegs:		
Lots 500 ₱ or over		@ 6½
Lots less than 500 ₱		@ 7¼
Litharge, bbls. ½ bbls. and kegs:		
Lots 500 ₱ or over		@ 6½
Lots less than 500 ₱		@ 7¼
Ocher, French Washed	5	@ 7
Ocher, Dutch Washed	5	@ 7
Ocher, American	₱ ton $10.00	@15.00
Orange Mineral, English	₱ ₱ 8½	@ 9½
Orange Mineral, French	10½	@11½
Orange Mineral, German	8½	@9½
Orange Mineral, American	8½	@ 8½
Red, Indian, English	4½	@ 8½
Red, Indian, American	3	@ 3¼
Red, Turkey, English	4	@ 6
Red, Tuscan, English	7	@10
Red, Venetian, Amer.	₱ 100 ₱. 50	@1.50
Red Venetian, English	₱ 100 ₱ 1.50	@ 1 75
Sienna, Italian, Burnt and Powdered	₱ ₱ 3½	@ 7½
Sienna, Ital., Raw, Powd	3½	@ 7½
Sienna, American, Raw	1½	@ 2
Sienna, American, Burnt and Powdered	₱ ₱ 1½	@ 2
Talc, French	₱ 100 ₱ $1.25	@1.50
Talc, American	.90	@1.10
Terra Alba, French	₱ 100 ₱ .95	@1.00
Terra Alba, English	.95	@1.00
Terra Alba, American No. 1	.65	@85
Terra Alba, American No. 2	.45	@50
Umber, Turkey, Bnt. & Pow.	₱ ₱ 2½	@ 3½
Umber, Turkey, Raw & Powd.	2½	@ 3½
Umber, Bnt. Amer	1½	@ 2
Umber, Raw, Amer	1½	@ 2
Yellow, Chrome	11	@14
Vermilion, American Lead	10	@40
Vermilion, Quicksilver, bulk		@70
Vermilion, Quicksilver, bags		@71
Vermilion, English, Import	.80	@95
Vermilion, Chinese	.$1 05	@1 20

Colors in Oil.

Black, Lampblack	12	@14
Blue, Chinese	36	@40
Blue, Prussia	32	@35
Blue, Ultramarine	19	@16
Brown, Vandyke	11	@14
Green, Chrome	10	@15
Green, Paris		@21
Sienna, Raw	12	@15
Sienna, Burnt	14	@15
Umber, Raw	11	@14
Umber, Burnt	11	@14

Miscellaneous.

Barytes, Foreign, ₱ ton	$19.00	@21.00
Barytes, Amer. floated	19.00	@20.00
Barytes, Crude, No. 1	9.00	@10.00
Chalk, in bulk ..... ₱ ton	3. 5	@ 3.50
Chalk, in bbls ..... ₱ 100 ₱		@ 35
China Clay, English ..... ₱ ton	10.50	@17.00
Cobalt, Oxide ..... ₱ 100 ₱	2.25	@ 2.50
Whiting, Common ₱ 100 ₱	.48	@ .55
Whiting, Gilders	.62	@ .68
Whiting, extra Gilders'	.66	@ .72

Putty.

In bladders	1¾@2¼
In bulk	1½@2
In cans 1 ₱ to 5 ₱	2½@4¼
In cans 12½ ₱ to 25 ₱	1½@2¼

Spirits Turpentine.

In Southern bbls	56½@57
In machine bbls	57 @57½c

Glue.

Cabinet ..... ₱ ₱	11½@16
Extra White	18 @23
French	12 @40
Irish	13½@16
Low Grade	9 @12
Medium White	14½@16½

Animal, Fish and Vegetable Oils.

Linseed, City, raw ..... ₱ gal.	.46	@ 47
Linseed, City, boiled	48	@49
Linseed, Scale and West'n, raw	43	@46
Linseed, raw Calcutta seed	75	@ ..
Lard, Prime	84	@85
Lard, Extra No. 1	65	@68
Lard, No. 2	..	@49
Cotton-seed, Crude, f. o. b. mills	34	@37
Cotton-seed, Summer Yellow, prime	42	@42½
Cotton-seed Summer Yellow, off grades	38	@39
Sperm, Crude	..	@ ..
Sperm, Natural Spring	71	@73
Sperm, Bleached Spring	74	@76
Sperm, Natural Winter	75	@77
Sperm, Bleached Winter	78	@80
Tallow, Prime	60	@62
Whale, Crude	..	@ ..
Whale, Natural Winter	46	@47
Whale Bleached Winter	48	@49
Menhaden, Pressed	31	@32
Menhaden, Bleached Winter	34	@35
Menhaden, Ex Bleached Winter	36	@37
Cocoanut, Ceylon	5¾	@ 6¼
Cocoanut, Cochin	5¾	@ 7
Cod, Domestic	39	@31
Cod, Newfoundland	35	@37
Red Spanish	47	@48
Red Saponified ..... ₱ ₱	5½	@ 5¼
Olive, Italian, bbls	51	@ 58
Neatsfoot, prime	57	@58
Palm, prime, Lagos ..... ₱ ₱	5½	@ 5

Mineral Oils.

Black, 30 gravity, 25@30 cold test ..... ₱ gal.	11½	@13
Black, 29 gravity, 15 cold test	12½	@13
Black, summer	11	@12½
Cylinder, light filtered	16½	@19½
Cylinder, dark filtered	15½	@18
Paraffine, 903-907 gravity	15	@15½
Paraffine, 903 gravity	14	@14½
Paraffine, 883 gravity	11¾	@12
Paraffine, red, No. 1	15	@15½

In small lots ½¢ advance.

CURRENT METAL PRICES.

APRIL 22, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1½ in. round and square..... ₱ ℔ .... @2.25*
1½ to 4 in. x ⅜ to 1 in..... ₱ ℔ .... @2.25*
1½ to 4 in. x ¼ to 5-16..... ₱ ℔ .... @2.35*
Rods—⅜ and 11-16 round and square. ₱ ℔ .... @2.45¢
Angles: Cts ₱ ℔
3 in. x ¼ in. and larger..... 2.10¢
3 in. x 3-16 in and ⅜ in..... 2.70¢
1¼ to 2½ in. x ¼ in..... 2.50¢
1¼ to 2¾ in. x 5-16 in and thicker..... 2.40¢
1 to 1¼ in. x 3-16 in..... 2.50¢
1 to 1¼ in. x ⅜ in..... 2.60¢
⅞ x ¼ in..... 2.70¢
⅞ x ⅛ in..... 2.80¢
⅝ x ⅛ in..... 4.00¢
½ x 3-32 in..... 4.50¢
Tees:
1 in..... 3.00*
1¼ in..... 2.50*
1½ in. and larger..... 2.50*
Beams..... 2.50@3.00*
Channels, 3 in. and larger..... 2.50 to 3.00*
Bands—1¼ to 6 x 3-16 to No. 8..... ₱ ℔ 2.50¢
"Burden's Best" Iron, base price..... ₱ ℔ 3.30¢
Burden's "H. B. & S. Iron, base price..... ₱ ℔ 3.10¢
"Ulster"..... ₱ ℔ 3.15¢
Norway Bars..... 3.75@4.25¢
Norway Shapes..... 4.00@4.50¢

Merchant Steel from Store—

per ℔
Bessemer Machinery..... 2.20¢
Toe Calk, Tire and Sleigh Shoe..... 2.30@3.00¢
Best Cast Steel, base price in small lots..... 7¢

Soft Steel Sheets—

¼ inch	2.40¢	No. 14	2.70¢
3-16 inch	2.50¢	No. 16	2.80¢
No. 8	2.50¢	No. 18	2.90¢
No. 10	2.50¢	No. 20	3.00¢
No. 12	2.60¢	No. 22	3.10¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	G. R. Cleaned.
Nos. 14 to 16	₱ ℔ 2.90	3.0 ¢
Nos. 18 to 21	₱ ℔ 3.00	3.10¢
Nos. 22 to 24	₱ ℔ 3.10	3.2 ¢
Nos. 25 and 26	₱ ℔ 3.20	3.30¢
No. 27	₱ ℔ 3.30	3.40¢
No. 28	₱ ℔ 3.40	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₱ ℔ 11½@14¢
Patent Planished..... ₱ ℔ A, 1 ¢; B, ¢, net.

Galvanized.

Nos. 14 to 16..... ₱ ℔, 3.24¢
Nos. 18 to 20..... ₱ ℔, 3.51¢
Nos. 22 to 24..... ₱ ℔, 3.78¢
No. 26..... ₱ ℔, 4.05¢
No. 27..... ₱ ℔, 4.32¢
No. 28..... ¢
No. 30..... ₱ ℔, 5.67¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast..... ₱ ℔ 15 ¢
Extra Cast..... ₱ ℔ 18 @ 20 ¢
Swaged, Cast..... ₱ ℔ 16 ¢
Best Double Shear..... ₱ ℔ 15 ¢
Blister, 1st quality..... ₱ ℔ 13 ¢
German Steel, Best..... ₱ ℔ 10 ¢
2d quality..... ₱ ℔ 9 ¢
3d quality..... ₱ ℔ 8 ¢
Sheet Cast Steel, 1st quality..... ₱ ℔ 15 ¢
2d quality..... ₱ ℔ 14 ¢
3d quality..... ₱ ℔ 12 ¢
R. Mushet's "Special"..... ₱ ℔ 46 ¢
" " " Annealed..... ₱ ℔ 75 ¢
" " "Titanic"..... ₱ ℔ 10 ¢
Hobson's Choice XX Extra Best..... ₱ ℔ 85 ¢
Jessop Self Hardening..... ₱ ℔ 45 ¢
Seamans' "Nelson" Steel..... 40 ¢
Hobson's "Soho" Special Self-Hardening..... ₱ ℔ 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block, Free. Per ℔
Banca, Pigs..... 31½@32 ¢
Straits, Pigs..... 31½@32 ¢
Straits in Bars..... 32 @32½¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20..... $3.75
IX, 14 x 20..... 8.25
Melyn Grade:
IC, 14 x 20..... 6.50
IX, 14 x 20..... 7.75
Allaway Grade:
IC, 14 x 20..... 5.50
IX, 14 x 20..... 6.60

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 ℔..... $4.70@4.80
IX, 14 x 20..... $ .00@6.25

American Terne Plates—

IC, 20 x 28..... $9.50
IX, 20 x 28..... $11.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₱ lb.

Ingot—

Lake..... 15¾@17¾¢
Casting..... 15¼@15½¢

Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, soft, sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 30 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7½ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7½ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20	21	21	21	22	23	24	27	30
30	96	72	20	21	21	21	22	24	27	30	
30	.....	96	20	21	21	21	23	27			
36	72	.....	20	21	21	21	23	25	28	31	
36	96	72	20	21	21	21	23	27	30		
36	120	96	20	21	21	22	24				
36	.....	120	20	21	20	23					
48	72	.....	20	21	21	23	25	28	31		
48	96	72	20	21	20	24	26	29			
48	120	96	20	21	23	25	29				
48	.....	120	20	22	24	27					
60	72	.....	20	21	22	24	27	32			
60	96	72	20	21	23	25	30				
60	120	96	20	22	24	27					
60	.....	12	21	23	25	29					
72	96	.....	20	22	24	29					
72	120	96	20	23	26	31					
72	.....	120	21	24	29						
108	96	.....	21	24	27						
108	120	96	22	25	28						
108	.....	120	23	26	30						
wider than 108	132	.....	24	27							
	.....	132	25	26							

Rolled Round Copper, ⅜ inch diameter and over, ₱ ℔ 20¢.
Circles, Segments and Pattern Sheets, 3¢ ₱ ℔ advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₱ square foot and heavier, 1¢ ₱ ℔ over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₱ square foot, 2¢ ₱ ℔ over the foregoing prices.
All Polished Copper, 20 in. wide and under 1¢ ₱ ℔ advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₱ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₱ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₱ ℔ ..... 24¢
13 oz. and up to 14 oz. to square foot, ₱ ℔..... 26¢
10 oz. and up to 12 oz., ₱ ℔..... 27¢
Lighter than 10 oz. ₱ ℔..... 28¢
Circles less than 8 in. diameter, 2¢ ₱ ℔ additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₱ ℔ extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
List Feb. 23, 1901.

Nos.	0000 to 8	9 and 10	11 and 12
	Base	½¢	¾¢ ₱ ℔ adv.
Nos.	13	14	15 16
	¼¢	⅝¢	¼ 1¼¢ ₱ ℔ adv.
Nos.	17	18	19 20
	1¼¢	2¢	2½¢ 2¾¢ ₱ ℔ adv

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	40	38	36	33	32	31	30	30	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	41	38	35	34	33	32	31	30	27	26
18	16	51	46	42	39	36	35	34	32	31	30	28	27
19	17	52	47	43	40	37	36	35	34	33	32	30	29
20	18–19	54	49	44	41	39	38	37	36	35	34	32	31
21	20	56	51	46	43	41	40	39	38	37	36	35	34
22	21	57	52	48	44	42	41	40	39	38	37	37	36
23	22	58	54	50	46	44	43	42	41	40	39	39	38
24	23	59	55	51	47	45	44	43	42	41	40	40	41
25	24	60	56	52	48	46	45	44	43	42	41	41	42

Copper Bronze and Gilding Tube, 3¢ ₱ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	32	20	27	21	21	21	21	21	21	23	25	27	28	₱ ℔	

Copper, Bronze or Gilding Tubes, 3¢ ₱ ℔ additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) June 6, 1898.
Brown & Sharpe's gauge standard.

Per ℔.

Plain Round Tube,	¼	in. up to	2	in. $0.35
"	"	⅛ "	¼	" ..... .36
"	"	⅜ "	½	" ..... .38
"	"	½ "	⅝	" ..... .41
"	"	5-16 "	¾	" ..... .48
"	"	¼ "	5-16	" ..... .65
"	"	3-16 "	¼	..... 1.00
"	"	⅛ "	3-16	" 1.50

Smaller than ⅛ inch..... Special
2 inch to 3 inch, to No. 19, inclusive..... .38
3 inch..... .40
Over 3 inch to 3½ inch, inclusive..... .45
Over 3½ inch..... .50
Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5..... 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	12	14	16	18	20	22	24	
and including	12	14	16	18	20	22	24	26	
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21 22, 23 and 24	.23	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24¼	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.33	.39	

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	26	28	30	32	34	36	38	40	
and including	28	30	32	34	36	38	40		
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*	
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68		
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71		
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75		

* Special prices not less than 80 cents.
Add ¼¢ ₱ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Hi Fig bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 2[illegible]; Copper Wire, Net.
List November 16, 96.
Spring Wire, 2¢ ₱ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₱ ℔, net..... 19¢
Finished Piston Rods, ⅝ to 2 in. diameter, ₱ ℔ net..... 20¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₱ ℔
Western Spelter..... 6@6¼¢

Zinc.

Duty: Sheet, 2¢ ₱ ℔.
600 ℔ casks..... 7 ¢ | Per ℔..... 8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₱ ℔. Pipe and Sheets, 2½¢ ₱ ℔.
American Pig..... 5@5½¢
Bar..... 5½@5¾¢
Pipe..... ⅛¢..... 20% off
Tin Lined Pipe..... 12½¢..... 20% off
Block Tin Pipe..... 40¢ net
Sheet Lead..... 7¾¢..... 20% off
Old Lead in exchange, 1½¢ ₱ ℔

Solder.

½ & ½, guaranteed..... 20 @20½¢
No. 1..... 17½@18 ¢
Prices of Solder in lioated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₱ lb.
Cookson..... ₱ ℔ 9 @9½¢
Hallett's..... ₱ ℔ 7½@7½¢
U. S..... ₱ ℔ 7 @7¾¢

Aluminum—

Duty: Crude, 8¢ ₱ ℔. Plates, Sheets, Bars and Rods, 13¢ ₱ ℔.
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots..... ₱ ℔ 37¢
100-℔ lots..... ₱ ℔ 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₱ ℔ 34¢
100-℔ lots..... ₱ ℔ 33¢
Aluminum Sheet, B. & S. gauge. 50 ℔ or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₱ ℔.	₱ ℔.	₱ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.40	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₱ ℔ extra.
Aluminum Wire, B. & S. Gauge.
Larger than No. 9, ₱ ℔ 40¢ | No. 15..... ₱ ℔ 43¢
No. 9 to No. 10..₱ ℔ 40 ¢ | No. 17..... ₱ ℔ 50¢
No. 11..... ₱ ℔ 41 ¢ | No. 18..... ₱ ℔ 55¢
No. 12..... ₱ ℔ 41½¢ | No. 19..... ₱ ℔ 60¢
No. 13..... ₱ ℔ 42 ¢ | No. 20..... ₱ ℔ 65¢
No. 14..... ₱ ℔ 42½¢ | No. 21..... ₱ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₱ ℔ 11½¢
Light and Tinned Copper	₱ ℔ 10½¢
Heavy Brass	₱ ℔ 8½¢
Light Brass	₱ ℔ 6½¢
Lead	₱ ℔ 4½¢
Tea Lead	₱ ℔ 3½¢
Zinc	₱ ℔ 4 ¢
No. 1 Pewter	₱ ℔ 13½¢
No. 2 Pewter	₱ ℔ 8½¢
Pure Aluminum, Sheet, ₱ ℔	21 ¢
Cast Aluminum, ₱ ℔	16¢
Tin Plate Scrap	₱ ton $4 50@4 75
Wrought Scrap Iron	₱ gross ton $18.00@18.50
Heavy Cast Scrap	₱ gross ton $17.50@18.00
Stove Plate Scrap	₱ gross ton $11.00@11.50
Burnt Iron	₱ gross ton $10 00@10.50